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SEPTEMBER 1959

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

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OVERSEAS,
YOU ARE AMERICA'S SPOKESMAN

The world WILL note and long remember what you say here, and what you do here.

See, To Tell the Truth, page 12

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

Volume III, Number 9 September 1959

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LETTERS TO THE EDITOR

LATE COMMENT

Sir: *I have just had the opportunity of reading through the March issue of* THE AIRMAN. *As usual, it was excellent; however, I found a mistake in the article* Twin Careers *in* Airman's World. *Kimpo AB is in Korea, not Japan.*

A/1C Charles Collins
Ellington AFB, Tex.

SMSgt. Hal Bamford, Departmental Editor, has enrolled, at the urging of the rest of the staff, in a basic course in geography.

★ ★ ★

ESPIRIT DE CORPS

Sir: *It was a real pleasure to read* Espirit de Corps Pays Off *in the May issue of* THE AIRMAN. *As a former member of the 40th Fighter-Interceptor Squadron, it is nice to know that the spirit which made them one of USAF's finest in my day continues to live with the new personnel.*

MSgt. George Ritson
Griffis AFB, N. Y.

★ ★ ★

TIME OF DECISION

Sir: *I have just finished the article* Time of Decision *in the June issue. It struck awfully close to home as I had a similar decision to make shortly after WW II. At that time I chose to get out. Despite the fact I had an excellent job on the outside, it wasn't long before I discovered I had made a mistake. Less than a year later I was back, and have been on active duty ever since. Incidentally, my recall was as a member of the Regular establishment. Having seen both sides, I would advise anyone, faced with this decision, to weigh all the factors carefully. Despite its share of shortcomings, USAF has a lot to offer.*

Lt. Col. Bert McDowell
Westover AFB, Mass.

Sir: *As a non-rated officer in a field which reflects his experience and education, I feel Lieutenant Sheehan is the exception rather than the rule. I believe most other journalism majors, engineers, and chemists who are assigned as supply or personnel officers will readily agree with me. If Lieutenant Sheehan is actually undecided about a*

Continued on page 37

More than half of my 17 years' experience have been spent in the information business—digging up nice things to write about my own or the units I've visited. It hasn't always been easy. There have been times when it was necessary to ignore a lot of prominent truths to produce a story that would be the least bit complimentary. Too many times I've been told that an outfit had an outstanding record in one or another thing only to find that they were like a Hollywood movie set—a false front built of cardboard window dressing and whitewash.

Before going to Plattsburgh AFB on Lake Champlain in New York to do this story for THE AIRMAN *I read an informal report about morale, living conditions, and retention at this SAC base. I didn't believe half of it and went fully prepared to do another whitewash job. I got the surprise of my life and the following story is among the most factual reporting jobs I've ever done.*

A TWO-W

by MSgt. Ed Blair, *Airman Staff*

ONE sergeant, newly arrived at Plattsburgh, told me that he was a bit shook up the first few days.

First, a noncom picked him up at the station and dropped him off at the billeting office to freshen up before he started processing the next day. Only, the billeting office turned out to be the plush self-supporting, Plattsburgh Hotel with maid service, soft beds, and private bath complete with personal bathmat and slippers. A visiting two-star general lived in the room next to him.

The sergeant took a second searching look during breakfast next morning before he decided that the elaborate wall partitioning off the serving line was simply a labor of love made of gilded paper egg separators. One look sufficed to convince him that the entrance hallway of the barracks across the road was painted a startling raspberry red. Behind the door marked "Processing" was a carpeted room with overstuffed furniture and artistic lamps that looked more like an expensive cocktail lounge than any processing center he had ever seen. And the master sergeant who offered him coffee and a seat was almost apologetic because finance couldn't pay the sergeant before lunch.

En route to the processing section he had passed the Family Service lounge and made a mental note to check on housing and things his wife would want to know. Down the hall was the OJT and Education Services office where he decided to enroll later for that off-duty course he had been postponing. The same building housed Personnel, Finance, and the Credit Union. The door he opened after he finished processing was across the hall from the reenlistment office.

Now this sergeant was no recruit. He had processed on and off a few other bases, stayed in some lousy transient quarters and in some good ones. He had found nothing like this. He got suspicious. Practically every base, he knew, was constantly trying to improve the environment, service, and food in their dining halls; make their barracks more comfortable and homelike; centralize and streamline processing; and, in general, improve morale. Just what, he asked himself, were they trying to prove at Plattsburgh? Was somebody really that interested in ordinary airmen?

I asked Col. Alvan Gillem, II, the same question. He is commander of the 380th Bombardment Wing which is Plattsburgh's reason for being.

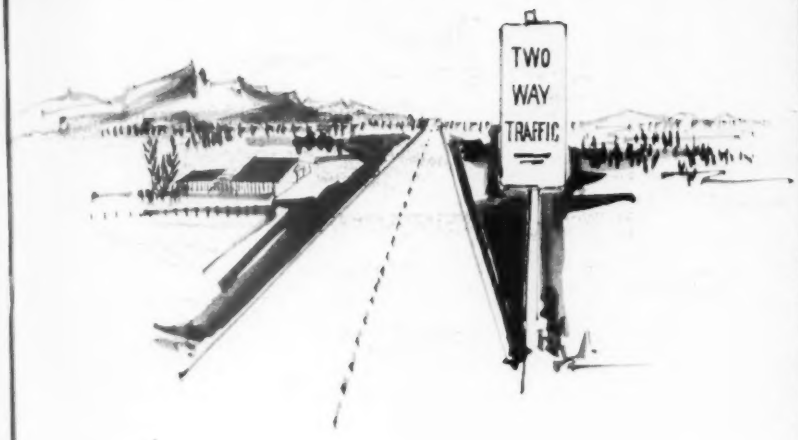
"We have two missions here," he told me. "We fly our airplanes on time and reenlist *good airmen*. One is essential to the other. We make good airmen want to stay and put our best men on the retention job. We think it is worth the effort."

The Colonel emphasized the term "good airmen" and the implication was clear. I was told that he can —and has—made it clearer.

On the flight line at Dock Two I talked to TSgt. Dan Doer, a veteran of 15 years. He had been a reciprocating engine mechanic and had been stymied on promotions before he reenlisted at Plattsburgh recently. He is now going to formal classes conducted by an Air Training Command Field Training Detachment until noon. After lunch he works on B-47s under the keen-eyed supervision of TSgt. Glenn Hinton.

"Why did I re-up? Well, for one thing, you don't get any of the 'that's tough, sergeant' treatment here when you have a legitimate gripe," Dan explained. "If my NCOIC can't take care of it for me, the squadron commander, or someone higher up, can—I just let them know.

"But it works two ways. We all know what we are expected to do, when to do it, and why we are doing it.



WAY Street

". . . seconds in the dining hall"

Like this airplane here. It *has* to fly tomorrow. See, it says so right here on the "F" schedule. I'm just cross-training, on-the-job, but I know that everybody right on up to the general himself expects me to do my part—and do it right. Just like when that kid over there says he'll put the cowling back, I know he will.

"We get treated like men and trusted to do a man's job. I'm not just another cog in the machine. I'm an individual, but part of the team, and my problems are team problems. When I hit this base I got the feeling that they wanted me, that the whole outfit was interested in me and would listen to my opinions."

Without realizing it Sergeant Doer listed the five points outlined in the 820th Air Division's Policy Letter Number Six. I saw and heard about the byproducts of the policy—improved morale, conscientious performance of duty and, overall efficiency—from the people most affected, the airmen and NCOs. I borrowed a copy from Lt. Col. Robert H. Clendenin, Director of Personnel. Titled "Human Relations," the policy letter is really nothing new. It outlines "the minimum acceptable standards" of Air Force personnel management policies that have been stated again and again:

Make new personnel feel at home and part of the unit; keep your men informed on unit missions; welcome constructive criticism from your men; give them a little time for themselves; and get the good ones to reenlist.

So what makes this so different at Plattsburgh AFB? No matter whom I talked to, from bird colonels to airmen third class, I got the same answer: Brig. Gen. James W. "Whip" Wilson never preached anything he didn't practice—twenty-four hours a day.

The division sergeant major, SMSgt. Tom Smith, has worked closely with General Wilson for several years and credits him with the success of the "Plattsburgh Plan." Before talking to the general I asked Smith what sort of person he was.

"General Wilson is hard, exacting, and fair," Smith said. "He makes people succeed in spite of their own misgivings by setting high goals for them. You must have a goal to get anything done.

"And the general also has a tremendous vitality. I don't think there is a man on the base who can keep up with him day in and day out. That's one reason he drives his own staff car—even if he felt he could spare an airman from another job to be his driver, he couldn't find one that could stand the pace. He doesn't waste his time on details either—that's what the rest of us are here for."

I found the general friendly, soft-spoken, with an almost shy smile, but he left me with the feeling that he believed in his five-point program and would brook no deviation from it. On the surface he belies his nickname—he knows that his men call him "Whip" out of his earshot. I learned that it is a term of respect and admiration, even affection. He sets his own examples. During "Operation Look Quick," a competition to test the bombing skills of Eighth Air Force division, wing, and squadron commanders, General Wilson bested 54 other commanders, including several of his own subordinates.

"Airmen reenlist for all sorts of reasons," General Wilson said, "because they can get seconds in the dining hall, or they can paint their rooms whatever color they want, or maybe there's a place they can build their hi-fi set. But mostly it is personal interest on the part of their supervisors that makes the difference. That's why our councils work so well. We call council minutes the 'voice of the people at work' because they show us what our airmen think is important."

"If a man wants zebra-striped walls, it

Left to their own initiative, airmen can transform barracks into homelike rooms. Natural pride takes care of inspections.

He referred to the seven council meetings held monthly that take care of the constructive criticism point in the policy letter. Under a paragraph headed "Democracy," General Wilson states emphatically his desires that all officers, NCOs, and airmen have a means of offering criticism and suggestions to the policies and directives issued by his division and subordinate headquarters. Furthermore:

"Commanders . . . will make every effort to adopt all suggestions that are beneficial to this command as a whole," he wrote. "Prompt and specific action will be taken on all suggestions recommended by the councils and duly published in council minutes not later than three working days after council adjournment. Any suggestion that cannot be implemented immediately will contain a suspense date for its implementation. Up-to-date minutes of *all* council meetings will be posted on *all* bulletin boards on the station."

All the suggestions that come out of these meetings aren't good ones but the command tries to follow most of them and let the troops find out for themselves. Somebody usually suggests that the bad ones be dropped before too much damage is done.

At Plattsburgh AFB *everybody* attends Commander's Call where they are periodically brought up to date on all facets of the base mission, the past, present, and future. Anything of general interest is also discussed here. Squadron meetings are encouraged weekly and must be conducted personally by the squadron commander twice monthly. Group and Wing Commanders' Calls are held monthly and General Wilson himself holds a monthly call for commanders and their staffs at Plattsburgh, Dow, and Griffis AFBs—all three bases of his division.

Within a week of arrival at Plattsburgh every individual meets his new squadron commander informally for an interview designed to help the man adjust to his new job. Within four to six weeks, after they know their way around, all officers, and technical and master sergeants have an informal personal interview with their group and wing commanders. Whenever it is possible, General Wilson also interviews the same individuals.

Another senior master sergeant from the Organizational Maintenance Squadron got enthusiastic about the base one night at the huge NCO Club.

"I've been around SAC for 13 years," he said, "and this is without a doubt the best outfit I've ever served in. General "Whip" Wilson may not remember me from Adam, but he's the greatest character I've ever run into. Brother, when we have an airplane set up to fly, it flies. This "F" schedule says so. We know how to count and we go by the numbers."

"Going by the numbers" is another of the five points and it doesn't apply just to aircraft. On the "F" schedule, aircraft by tail number, are set up to fly designated missions on specific days a month in advance. Only a major catastrophe will change it. Maintenance and crews have positive schedules and every man concerned carries a schedule with him. Every recurring program, meeting, and event is scheduled so that it is held on the same day and at the same time each week or month. Anyone who wants to promise the kids a fishing trip or the wife a shopping spree can do so with assurance that time will be available. Work is based on a 40-hour week. If overtime is necessary something is off schedule and if something is off schedule *someone* has goofed and his buddies are paying for it. That's not good.

Everyone knows why it isn't good because they've been told. On the fourth Monday of each month wing commanders assisted by their staffs personally conduct an orientation program for all newly arrived NCOs and airmen. This supplements the informal personal briefings and they are told of the base mission, facilities, directives, and anything else that will help them fit into the organization. New officers get a similar briefing two days later. Attendance is mandatory at all meetings. There's no excuse for anyone to answer "I don't know" at this base.

Close to a thousand airmen at Plattsburgh are undertaking active on-the-job training. Others are cross-training on-the-job—attending formal FTD classes half the day and working the remainder. The education sec-

Arriving unannounced at a council meeting, General Wilson perched on stool, got firsthand knowledge of airmen's problems.

it's OK by me."

tion holds four-hour classes daily for those unable to pass the eighth grade GED exam. About 500 men are actively studying ECI and USAFI courses either separately or in groups. The result: nearly 400 men upgraded in their AFSCs during the first six months of FY '59.

The fifth point in the Plattsburgh Program is retention and it is accomplished in the same aggressive manner. A prominently displayed chart in each duty section names men eligible for reenlistment. Maximum use is made of the short discharge and supervisors start their campaign early. Every squadron has a retention NCO whose sole duty is to ride herd on the reenlistment program. Commanders and NCOICs are expected to be intimately familiar with the program and are required to personally talk to each eligible at least once a month.

Emphasis is added by senior commanders who include a statement in squadron commanders' effectiveness reports to reflect the results of their retention programs. Likewise, NCOICs who have eligibles in their sections get similar notations on their Airman Performance Report (Form 75). Last year Plattsburgh led all of Eighth Air Force in reenlistments but when I talked to MSgt. Martin Wolin, NCOIC of the reenlistment section in May, he was both worried and disappointed. They had re-upped only 78 of the 80 airmen who were eligible the previous month.

And they sell careers, not short term re-ups at Plattsburgh. The reenlistment sales talk is built around a solid investment program for retirement in 16 or 18 years. Assets of the Credit Union have passed the half million dollar mark and a five percent dividend on investments is normal. This year it may go higher. Retention people show airmen how regular savings from their pay, plus reenlistment bonuses, can be parlayed into a $12,000 retirement nest egg with an investment of only $6,550.

"We used to think that there was some sort of gimmick to retention," Colonel Gillem said, "but we've learned differently. I know my NCOs personally—they are all good ones because I get rid of the bad ones fast. They know that I mean business and I make no false promises. We've had a quality control roster of our noncoms for a long time now, and our flying record has gone up in direct proportion to our reenlistment rate."

But the key man in Plattsburgh's retention program is the squadron commander, Colonel Gillem told me. At random I picked on Maj. Harry P. Knickerbocker, commander of a supply squadron, and asked him for his formula.

"First, we let a new man know that we need him," the major declared. "Every man starts fresh here. We ignore his background until he proves himself to us. If he can't work and act like a man, I fire him. I try to put him in a room with an airman who has just re-upped—they are our best salesmen and a lot rubs off when they compare notes.

"There are no squadron secrets. I personally see that the men's questions and problems are taken care of. And *I* am the only person in this organization who can turn down a leave request. That makes me the S.O.B. instead of the NCOIC that he has to work for. Of course I back up my NCOs—if they tell me a man can't be spared, I justify the denial for the airman."

Major Knickerbocker lets natural pride take care of the barracks. Most of the rooms have rugs, curtains, and soft beds equipped with personalized spreads. Rooms are painted to suit the individual. "If a man wants zebra-striped walls, it's OK by me," the major

General Wilson samples dining hall food, discusses a staff problem with a senior officer and a sergeant, observes attitude of other diners.

(Editor's note: Since this story was written General Wilson has been reassigned as SAC's Inspector General.)

said. "He'll take better care of it when it suits his fancy, not mine."

There's a locked mail box on each door in the barracks and a rack of them for airmen living off base. Instead of holding mail call at a time convenient for him, the mail clerk tucks mail into the locked boxes and the airman picks it up whenever he wants to. A lot of the men have dressers, chairs, beds, and lamps bought from a store in town. In effect, they rent it, because they pay only two dollars a month and once paid for it becomes squadron property. Any airman on the base can take advantage of this merchant's offer.

Every squadron and nearly every duty section has its own self-sustaining coffee bar with doughnuts, candy, soft drinks, and even cigarettes available from early morning to late evening. The squadron bars are run by nonproductives, such as men awaiting security clearances, assigned light duty for medical reasons, or simply awaiting orders.

A year ago more than 100,000 people attended a Base Jubilee that featured amusement concessions and carnival rides and a two-night dance stand by Louis Armstrong's band. Each squadron got a cut of the profits to fix up attractive, panelled, day rooms and TV lounges with rugs, curtains, and comfortable furniture. The remainder of the money was set aside to provide cash awards (for upkeep of these accommodations) to squadrons with top retention rates.

Wherever I went on the base I noticed airmen and officers alike going about their jobs with an air of quiet, confident efficiency; with no bickering or indecision. It was pretty obvious that General Wilson hadn't signed his name to a bunch of empty words that required only lip service or an occasional report to prove compliance. The necessary authority had been delegated with the responsibilities right on down to the lowest supervisory level. Nobody had taken the responsibility lightly.

Personnel actions at Plattsburgh prove this. A lot of airmen who didn't measure up traveled Route Nine (U. S. Highway 9) last year with a discharge in their pocket. More than 450 sub-standard airmen were eliminated via AFR 39-16 (Inaptitude or Unsuitability) and AFR 39-17 (Unfitness). Eighteen of the 24 noncoms who met a 39-30 (administrative demotion) Board were reduced, three others went to a review board at Hqs, Eighth Air Force, and three were retained in grade.

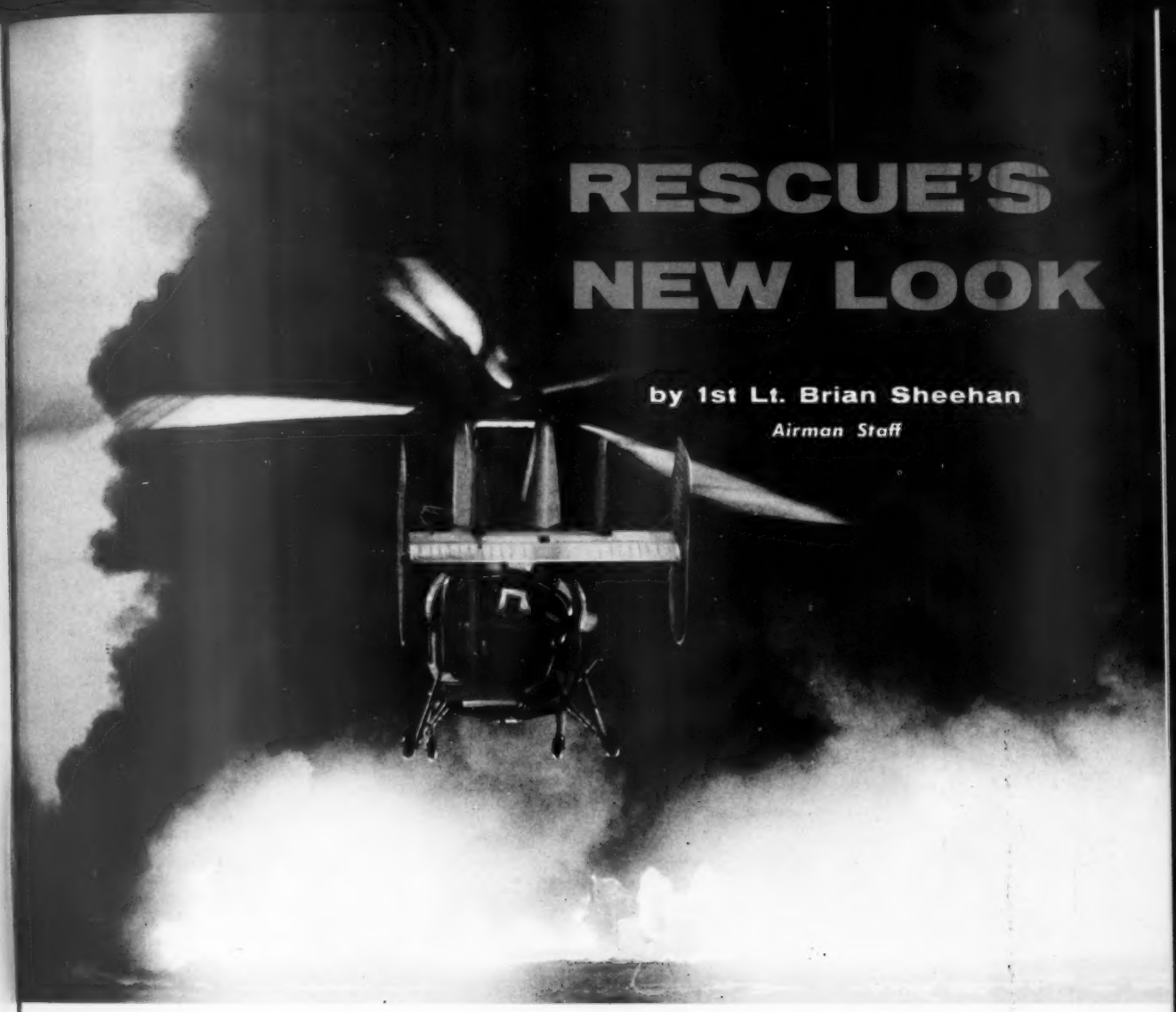
But one young airman I talked to figured he couldn't agree with General Wilson's policy more than 90 percent. He didn't think the general was fair about the OJT program. He told how busy they were in his section, what a good NCOIC he had, and how the sergeant had helped him get ready for an OJT exam, sometimes at the expense of letting other things go.

"But I'm sorta dumb, you see, and I flunked. Now I don't see how the general can blame other people because *I'm* stupid. But he does. Well, Sgt. ——, (and boy they don't come no better), and my OIC, and the first sergeant, and even my squadron commander, all had to go with me up to the wing commander and explain why I failed. I wouldn't be surprised if General Wilson didn't ask the colonel why he didn't teach me himself. I just don't think it's fair to blame them because I'm stupid."

He was more ashamed of the inconvenience he had caused them than he was of his own shortcomings. He had been given another chance and was determined to pass the next time because he wanted to reenlist.

"Keeping good airmen (again there was emphasis on the term) is no real problem," General Wilson had said. "But it's a two way street. When a supervisor takes his job seriously enough to look after his men properly, it comes back to him in a job done better because the men want to do it. I don't pamper anyone, but in my 11 years as a commander I've learned that if you treat your men right they'll do the same for you."

I found both morale and efficiency so high at Plattsburgh AFB that instead of white washing I've had to tone down my telling of the story. The only explanation I can find is that General "Whip" Wilson, his commanders, and his NCOs have hewed to the line of quality personnel management and let the chips fall where they may.



RESCUE'S NEW LOOK

by 1st Lt. Brian Sheehan
Airman Staff

THE sooner rescue help, equipment, and medical aid are rushed to aircraft accident victims the better chance they have of surviving.

With this in mind the Air Force has adopted a new look in local crash rescue. What is it? More than a hundred small H-43 helicopters that pack 1,000 lbs. of fire-fighting equipment, carry a three-man crew, and can reach remote, inaccessible areas. Where will they be based? Eventually at nearly every stateside Air Force base. Their mission? Provide bases with a 75-mile radius of "blanket" rescue coverage.

In the past local rescue has meant everything from plucking lost fishermen from storm-tossed seas to pulling a pilot from a burning aircraft. To do this, quick timing, precision equipment, and coordinated teamwork are necessary.

Now, however, something more is needed. Most modern aircraft carry large fuel supplies. If these planes crash, awesome fires can result. Fire trucks, because of mountainous terrain or long distances, can't always reach the crash site in time. This is where "rescue's new look" steps in.

In response to fire calls within a 15-mile area the new H-43 helicopters carry special flyaway fire-fighting equipment that can squelch, or limit, almost any blaze. This means chances of surviving some aircraft accidents are better today than ever before.

A number of the swift, 13-foot-tall helicopters are now in operation at nine Air Training Command bases. In the near future a total of 143 'copters will be in use —two at each designated base. One will be used for "standby alert" and the other held in reserve.

Accompanying each new helicopter is an attachable fire-fighting kit. It consists of a stainless steel sphere which holds water, a five-gallon liquid foam tank, and a 150-foot hose that can spray a wide or narrow stream. Together, the water and foam make up 850 gallons of expanded fire-killer. A hundred gallons of foam per minute can be pumped.

During standby alert, fire equipment is stowed on a

four-wheel trailer near the helicopter. When an emergency call is received and fire equipment requested, the helicopter pilot runs to his aircraft, starts the engine, takes off vertically and hovers over the steel tank.

The fire equipment is attached to a hook underneath the whirly-bird, and then two rescue specialists—a fireman and medic-crash entry technician—jump aboard the small aircraft. The mission is underway.

A few minutes later the pilot sets his aircraft down near the crash site and the flying fireman and rescue medic get into action. One of them unreels the hose and streams foam on the flaming aircraft while the other rushes to assist survivors.

Meanwhile, the 'copter pilot lifts his aircraft away and swings into a position nearer the fire. By careful maneuvering he turns the rotors' downwind blast against the fire. He succeeds in blowing the flames away from rescue technicians while they perform the rescue.

If survivors are injured they are airlifted back to the base while the medic administers in-flight first aid. The fireman stays on the crash scene and controls the blaze until further assistance from conventional fire trucks arrives.

Recently, as part of the new air rescue program, some Air Force pilots and mechanics completed flying and maintenance training for the H-43 helicopter at the factory.

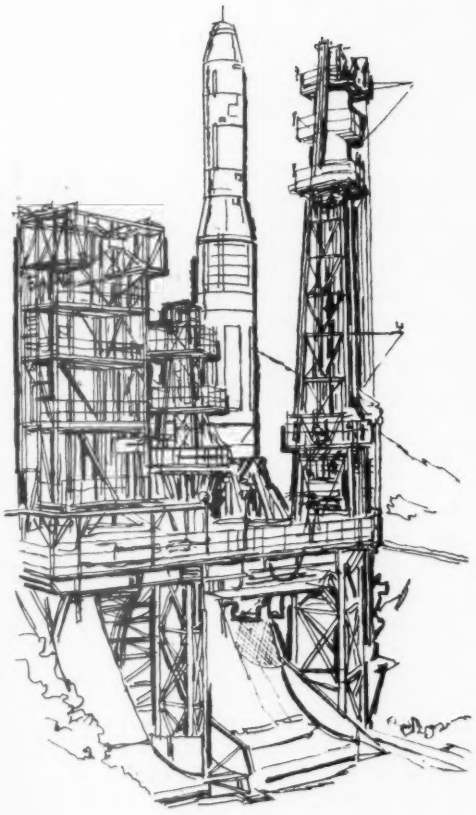
First Air Force bases to receive the small helicopters and fire-fighting equipment were Laredo, Moody, Perrin, Connally, Greenville, Randolph, Keesler, Craig, and Vance.

Soon, other bases will be receiving pairs of the trim helicopters. When they do base firemen won't necessarily be out of jobs. Instead, a new dimension in fire-fighting will have been added to their specialty.

On crash scene, airmedic and fireman place injured man into H-43 helicopter.

Portable fire-fighting equipment is stowed on flat bed truck, attached to chopper when needed.

Fire equipment is set on ground by helicopter pilot. Soon rescuers will jump from aircraft, put out inferno.



TESTS of the TITANS

For the benefit of their brethren, some are tested to death.

LIKE the touchdown run that thrills the crowd, the blast-off of a mighty *Titan* ICBM draws national applause; and like the months of planning and training that put the runner over the goal line, the years of research, development and tests culminating in the launch-pad finale often go unsung. For the sinews and nerves of the finger that trips the FIRE button are imbedded in thousands of laboratories, throughout hundreds of industries and across months of fervent endeavor.

The bellowing, fiery ascension represents 200,000 pounds of the coordinated, multitudinous efforts of the best scientific, military, technical, and industrial brains of the Nation. Enclosed in its gleaming, 90-foot long frame are 300,000 separate parts, all working in harmony. If even one fails, the *Titan* may be destroyed.

Yet four times in a row, the *Titan* blasted from Cape Canaveral in 100 percent successful test flights. In the words of Lt. Gen. Bernard Schriever, commander of ARDC, "These four successful first flights establish a new record in missile testing."

To appreciate the full meaning of General Schriever's remarks, it is necessary to travel backwards from the launch-pad into the unbelievable pyramid of the most thorough, varied, and extensive test program ever undertaken in the history of the machine age.

The program is called a "pyramid" because each series of tests, when laid out on an adapted production chart, forms a pyramid divided into four distinct levels. The apex, or fourth level, is the pay-off at the Cape. The other three levels, down to the broad base where thousands of individual component tests, production environmental tests, and quality control tests are conducted, exist only for a successful launch-pad climax.

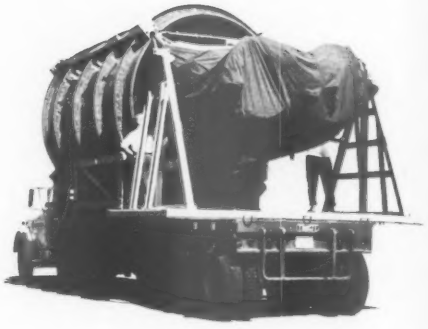
What makes the test program for *Titan* different from every other test program? For one thing, it was established separately, but simultaneously, with the *Titan* (or Weapon System 107A-2 as it is officially known) development program. The Air Force needed this missile in a hurry and it had to work. It couldn't afford a "haste makes waste" crash approach. It would take time enough to get the missile on the pad; risks it wouldn't work there had to be avoided.

Most of the test program, and all of the final tests, are conducted at the Martin Company's test facility 25 miles southwest of downtown Denver. Doing everything possible, short of flight itself, to prove each of the 300,000 parts in the bird and the system before it is sent to Cape Canaveral is the concept on which the test program is based.

Take for example, the first level of the test pyramid. Like its Egyptian namesake, the first level is meticu-

A component undergoes 20-G acceleration on the giant centrifuge of the PET laboratory.

A first stage rocket engine and a battleship tank are trucked up the hill to the test stand.



lously constructed to support the balance. The *Titan* has an airframe made of aluminum containing a high copper content. Early in the game, engineers had to find a way to weld this normally "unweldable" alloy. For six months they ran destruct or life tests on weld after weld until they were satisfied the problem was solved.

Then there were the fuel tanks. *Titan's* tanks aren't just built and installed. Each one must be capable of withstanding enormous pressurization. After it's built it's worked over in pneumatic pressure tests, X-rayed for leaks, and put in a king-sized silo in the Hydrostatic Testing Laboratory where it is cleaned and tested by water while TV cameras scan for bubbles.

But that's not all. When this lab finishes repairing any leaks and retesting, the tank goes back to the factory and into a *Titan*—where it gets more tests.

The rocket engines for both *Titan* stages, made by Aerojet-General at Sacramento, are first fired and accepted by the Air Force at Sacramento, before they are shipped to Denver. At Denver, hydraulic, electronic, electrical, instrumentation, and plumbing systems on incoming engines are thoroughly checked.

Meanwhile, still on the first level of the pyramid, nine associate contractors, 75 major subcontractors, and thousands of suppliers and vendors in the program are doing their own testing. They take their components and mercilessly expose them to heat, altitude, cold, vibration, humidity, salt, sand, fog, wind, and rain. In this way each part's performance is checked against military requirements.

These are the first-level component tests. Next come the Production Environmental Tests, called PET, and the Quality Control Tests. Both are still on the first pyramid level.

About half of the individual component testing is conducted at the Martin plant. PET and Quality Control Testing are also done there. The already thoroughly tested components are again put through every fiendish device engineers can conceive. For instance, an item might be subjected to the same series of tests it received at the manufacturer's plant, but the series is now conducted simultaneously. In the PET laboratory engineers can create a 250,000-foot altitude, temperatures of minus 120 degrees to plus 450 degrees, and almost any identifiable weather condition.

When each component or subsystem has passed all tests, it goes to the factory accompanied by its complete manufacturing and test history. There it becomes a part of a missile.

At the second level of the test pyramid, the missile stages are placed into Martin's 13-story building, called the Vertical Test Fixture (VTF). The *Titan* on its transtainer is drawn into a center aisle, flanked on both sides by a series of booths or cells. An overhead crane picks up the missile and places it vertically in a cell. For the first time, the *Titan* stands up in its natural position.

Director of Plans and Programs at Martin Denver is William Purdy. He and his team plan the entire test operation. The history of each part and a set of engineering test specifications accompany a missile into the cell, and are written into test procedures.

There are nine cells in the VTF. Two are called "open" cells in which are located the test missiles, which could fly but never will. They will be tested to death, for the benefit of their brethren. The walls of the control room for the open cells are studded with bank after bank of strain gauges. In the open cells, a missile is subjected to all flight conditions simultaneously.

Missiles destined for actual firing are tested in the seven "closed" cells, which are equipped with gantries and doors. In two of them, engineering tests are run on the *Titan's* hydraulics and associated systems.

In another, the missile is loaded with simulated propellants—water and liquid nitrogen. The electrical and electronic systems are measured for feedback, along with the stresses and strains that flight will apply on the black boxes of the system's hardware.

In the remaining four closed cells, the *Titans* undergo the most exhaustive physical examination in history. The gantry levels close around the bird, forming a stack of closed rooms with the missile in the middle, and the vast steel doors are shut. Then 50 men begin hooking up to the nearly 500 separate sensor points in

the missile. They are looking for trouble; if it exists, their function is to find it.

Their equipment is functionally identical to the gear used at operational *Titan* complexes, differing only in the length of the cables. The only equipments they lack are the propellant-loading and engine ignition systems.

An incoming *Titan* is first erected in a VTF cell, then the electrical busses, tankage and pressure systems, including all valves, regulators, indicators, and individual working parts are thoroughly tested.

Next every component in the propulsion system is checked, short of actual loading and ignition.

Then the guidance system is "married" to the *Titan,* and it's a very close union. Missile telemetry is tested next, during which the missile's antennae actually transmit to ground station receivers. Then a timed countdown is run, simulating all the functions of the *Titan.*

After the countdown, the data, constituting a detailed pedigree of the bird, is reviewed by a team of representatives from the Air Force and the *Titan* associate contractors. From this data, the *Titan* is evaluated. Although a specific test objective is to keep the components "new" and unaffected by the testing, a damage check for any minor random injuries is conducted during missile evaluation. If the *Titan* passes this evaluation, it is bought by the Air Force.

On the third pyramid level the missile goes to "the top of the hill," the captive test stand, its last stop at Denver. It is accompanied by a log containing a history of every component, and a second historical log on the missile as a whole.

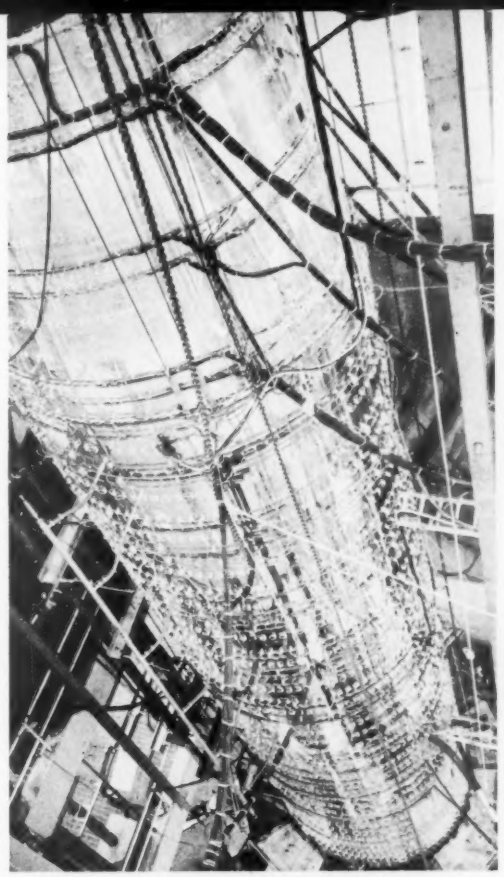
The captive test stand differs from operational *Titan* launch pads in one detail only: there are no explosive bolts in the stand to release the missile for flight. Otherwise, it's a flight situation and launching crews are first trained here.

There are several more tests, now, before the Missile Compatibility Firing (MCF) which is the last test short of flight. Pre-MCF tests begin with a guidance and control checkout, conducted entirely from the blockhouse which is located at a safe distance from the stand. At the same time, propulsion gets a going over with full pressurization checks using liquid nitrogen and liquid oxygen at —300 degrees. Other test groups check out various other systems.

There are two other basic types of tests run "on the hill," but they do not involve the missiles destined for Cape Canaveral. They are the battleship tests and captive missile tests. The captive birds will never fly and are used for improving the breed. Besides specification tests, they are subjected to such "breaking-point" stresses and loads as diabolical delays at awkward moments, hours-long cold-soaking, gleefully intentional errors. They are the martyrs of Martin, but what they tell means success or failure on the launch pad.

The battleship tests are so-called because of heavy steel-girdered tanks used instead of the usual propellant tanks. With these—built as they are like a battleship—propellant and propulsion tests can be run without any tankage considerations.

Finally, in the Missile Compatibility Firing tests which yield roughly 225 major measurements and separate bodies of data, the complete *Titan* weapon system functions as nearly as possible as it would if the missile were airborne. Most firings are nocturnal and as a test stand supervisor put it, "rockets and babies are born at night."



The giant sleeve of high-wattage quartz lamps, to simulate the friction heating of flight, completely enclose a Titan.

The MCF completed, the missile is as ready for flight as it can be made. The *Titan* stages on their transtainers are trucked 15 miles to Lowry AFB for airlift to Cape Canaveral and the ultimate flight test. The thoroughness of the testing and preparation in Denver and the speed of the airlift mean little must be done at the Cape facility outside of the launch itself.

On Tuesday, February 3, a minor but new and gremlinish malfunction occurred during a Cape launch attempt, and Missile Test Center personnel called the missile test laboratory in Denver. By noon the next day, the launch setup and conditions had been duplicated exactly on a test stand, and a firing was attempted. The same malfunction happened. By Wednesday night, the answer was worked out and the new data transmitted to the crews at the Cape. Less than 48 hours later, on Friday, February 6, the *Titan* flew.

It was like New Year's Eve on Martin's hill that night.

To Tell

DURING the coming years it is probable that millions of servicemen and their dependents will be living abroad. If you are one of them and have read and taken seriously *The Ugly American,* you may well shudder at the idea of what this will mean to American public relations overseas. Yet, the American traveler, and especially the self-disciplined airman, can be the best advertising medium of all in conveying to other people what our country is like and what we as individuals stand for.

It is likely the average airman does not know that when he goes abroad he can call on the nearest United States Information Service post and receive free copies of a wide range of pamphlets, booklets, colored maps, and other materials, either in English or the local language, for distribution to his foreign friends.

Or, if he wishes to give these friends a more colorful idea of the interesting sights around America, USIS will be glad to let him choose from a wide variety of Americana and technical films and furnish him a projectionist too for a night's performance.

Often there are travelling theatrical groups of American performers, well known orchestras, and lecturers, under the auspices of the Department of State abroad, and many times the information officer is looking for a way of getting large blocks of complimentary tickets to the right people. The airman can play host to his neighbors or a local group on occasions like this and make lasting friendships which will make his stay in the country a full and enjoyable one.

Thus, having so many of our countrymen on foreign soil can be a happy advantage, because USIS has the materials for telling the story and there is no better way to get it into the hands of local people near our military bases overseas than by way of direct contact between them and our airmen.

Broadly speaking, the U. S. Information Agency, as it is called in Washington (abroad it is "Service" instead of "Agency"), seeks to accomplish its mission

How you and your dependents can help the United States Information Service tell the true American story throughout the world.

ll the Truth

by Robert deT. Lawrence (Lt. Col., USAF Res.)

through all the primary information media . . . radio (Voice of America and locally produced programs); press and publications; educational exchange (sending students and technicians abroad and bringing those of other countries to the United States); libraries and exhibits; motion pictures, and the People-to-People's program which engages in such projects, for example, as the brotherly affiliation of Boston with Rome, Italy.

Under the able direction of veteran Foreign Service diplomat George V. Allen, USIA staffs and manages 197 posts abroad, not including bi-national centers and USIS-supported reading rooms, staffed with local employees only. It accomplishes this on a yearly budget which is about half the cost of construction of a major naval ship, and most of the posts are in the countries where our largest military units are stationed.

The Air Force figured strongly in one USIS project during recent months at the time of the Middle East crisis and the placing of our forces in Lebanon in response to a request for protection against threats to the independence of this friendly, free nation.

Faced with some initial suspicion of U. S. motives, USIS made special efforts to provide the people throughout the area with the true facts. Air Force planes dropped a million USIS leaflets printed in Arabic giving the statement of President Eisenhower on the sending of troops.

At the same time, the Voice of America with its world-wide service directed mainly toward Communist countries, tripled its broadcasts to the Middle East, carrying 30 minutes of news in Arabic on the half-hour and in English on the hour, 24 hours a day.

It is interesting to note that when the VOA detected Russian jamming of live United Nations broadcasts to an intense degree, it tape recorded the jamming to show how the USSR prevented its people from learning the facts on this vital question, even to the point of jamming the words of its own delegate, Andrei Gromyko. Tape recordings of the jamming were used repeatedly by radio networks in many countries.

USIS in Formosa last year provided photo stories, taped interviews, and motion picture coverage on the Red attack in the Taiwan Straits, concentrating especially on the suffering of civilians under the Chinese Communist bombardment. An Agency newsreel on the subject, "This is Quemoy," was seen by many audiences in the Far East.

The high level achievements of U. S. science and technology, products of the free American system, receive priority from USIS. Reporting of the Air Force *Atlas* missile launching in December included VOA interviews in German and English with *Atlas* scientists and a 10-minute documentary film showing the missile going into space and a recording of the President's goodwill message to the world.

The striking travelling exhibit, "The Family of Man," has been seen by almost four million people in three-and-a-half years and continues to draw large audiences. The German newspaper *Hannoversche Rundschau* wrote, "All of the masterful photos testify that there is only one family of man; that man in his loves, his hopes, his pains, and his death is the same everywhere . . ."

USIS free libraries, with books on open shelves available to all, are well patronized abroad. The Agency helped bring out almost five million copies of books about America in 32 languages during six months in 1958. In 10 years the translation program has published and distributed 47 million books in 50 languages. All USIA effort is directed overseas of course.

Director Allen recently stated, "there is reason to believe that the Soviet authorities are finding it awkward to explain their refusal to allow the Russian people to hear news of the outside world." We all, especially airmen abroad, can assist in the effort to assure the peoples of other countries that the U. S. is determined and able to help the Free World resist armed aggression.

perils & plights of pilots

by TSgt. Harold L. Craven
Airman Staff

Man's right to fly has frequently been disputed by lesser beings. Yellowed records in the Pentagon and at many USAF installations tell tales of challenges flung in the faces of flyboys by geese, ducks, pelicans, snakes, and even opossums. One of the most unusual stories involves a mid-air collision between an airplane and a tuna fish.

According to the *Air Corps News Letter,* pre-World War II counterpart of THE AIRMAN, an aviator en route from Vera Cruz to Guatemala City was flying at 2,000 feet when a tuna crashed into his windshield. Since the glass was only shattered he was able to scrape the fins and scales away and continue on his journey. The only explanation he could give fellow pilots and fishermen upon his arrival at Guatemala City was that the fish might have been dropped by a high-flying frigate bird.

While documented cases of mid-air collisions between fish and airplanes are rare, it is well known that hundreds of birds have met their doom by flying into airplanes. Maj. L. C. Mallory, commander of the 73rd Attack Squadron at March Field, Calif., in 1938, became an "ace" in a single mission when six wild geese attacked his plane. One crashed into the oil radiator and remained there; another shattered the left landing light; a third smashed into the fairing over the plane's right landing gear mechanism; the fourth struck the fairing around the main gasoline strainer; and the fifth did extensive damage to the right wing. When the feathers cleared only one of the long-necked *kamikazes* was still in action, and he was charging fiercely in the opposite direction. After some difficulty in getting his right landing gear down and locked, Mallory landed and reported his multiple victory.

Pelican-Sized Mouthful

While practicing gunnery near Oceanside, Calif., Lt. Nelson Brown and his gunner, Pfc. Frank Barnett, collided head on with a pelican. The big-mouthed bird smashed through the windshield of the A-17 attack plane, knocking Nelson unconscious, smashing his goggles, and cutting his face and head painfully. The bird passed on through the fuselage and emerged at the other end, damaging the plane's tail surfaces.

Barnett grabbed the control stick and kept the crippled plane under control until the lieutenant regained consciousness and again assumed control of the airplane

for the return flight to March Field. The incident prompted an airman poet to pen these lines:

Mr. and Mrs. Pelican flying on high
Spied a gold-blue streak in the summer sky.
"That'll never do," said Mr. Pelican to his shrew,
So with squawk and squeak away he flew,
To meet what? He never knew!
With an awful crash they met in midair—
Feathers and glass flew everywhere.
But Mrs. Pelican only had seen
Her hubby crack up in an A-17.

The March Field poet would have been in his glory had he been stationed at Kelly Field, Tex., in 1920. In that year Lts. Myron Wood and Bill Maynard learned the hard way that some non-human enemies of aviation resort to infiltration techniques to gain their ends. In this case the enemies were wasps who had started a construction project in an exhaust pipe. At 2,000 feet the engine started spouting flames and oil and soon the wasp nest was ablaze. The pilots, thinking the airplane was burning, started sideslipping toward Kelly where they struck the ground violently and ripped off the plane's undercarriage. Fortunately they were able to crawl out of the wreckage uninjured and unstung.

The Snake Pit

Birds and insects have often plagued aviators, but tales involving interference by poisonous reptiles are as scarce as cats at a dog fight. Nevertheless, pilots do see snakes occasionally.

At France Field, Canal Zone, in 1921, a pilot climbed into his cockpit, took one look around him, and climbed ever-so-carefully out again with a horrified look on his face.

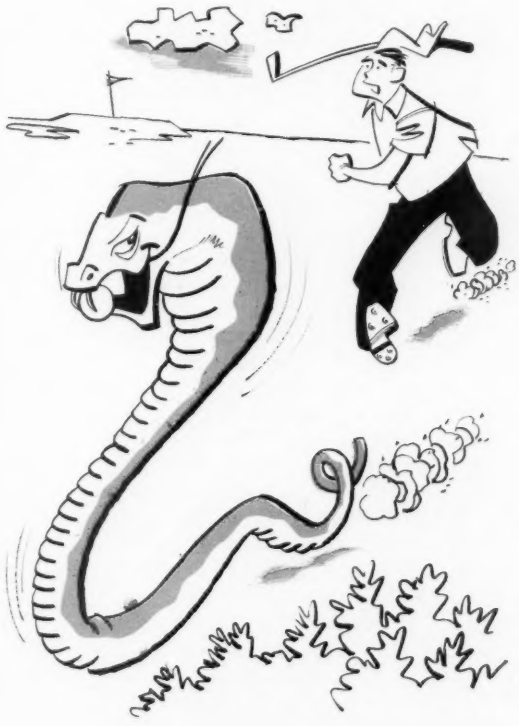
"Tell me I'm not seeing snakes," he implored his crewchief.

The crewchief peered into the cockpit and replied: "It's a Tom Goff snake, sir. Good thing you found him before you got up in the air. Them things are deadly!"

France Field personnel remained snake conscious for many months after the incident. One day a mechanic heard noises in the fuselage of a parked aircraft, called his buddies together, and organized an attack. They ripped the fabric off the fuselage and found a family of opossums had taken up residence there. For some time thereafter it was not uncommon to see mechanics performing their duties with baby opossums clinging tightly to their shoulders. Pilots and mechanics did, however, continue to look for snakes before climbing into their airplanes.

Fearsome Foursome

Four commissioned golfers—two majors, a captain, and a lieutenant—were maintaining their physical fitness at Stotsenburg, Philippine Islands, a few years prior to World War II, when they found that a golf course can be as dangerous as an airplane cockpit where snakes are concerned. Everything was going fine until a six-foot cobra appeared on the scene and raced them to the ball. The cobra got there first, grabbed the ball, and started to make off with it, then turned around to face its pursuers. The officers formed a 50-foot circle around it and made a quick estimate of the situation. Then, because of his youth, dexterity, courage, and



lower rank, the lieutenant was chosen to lead the attack, which he did, killing the snake with his golf club. Following the incident the senior major in the group issued this statement through Clark Field's public relations officer:

"I cannot too strongly emphasize the credit due the lieutenant in so ably assisting me in killing the cobra, thus making golf at Stotsenburg safe for women and children."

Sergeant Schultz examines a dud in an old crater at Plumtree Island.

mission to Plumtree

A pilot, photographer, writer, and an explosive ordnance expert join forces in a dangerous mission for public safety.

OUR chopper circled several times while the pilot looked for a safe spot to land. Actually, there weren't many "safe" areas—not in this place.

The sun beamed in full brilliance, highlighting a balmy, cheerful spring afternoon, but 500 feet below, Plumtree Island—dotted with hundreds of craters—bore a startling resemblance to the Moon.

Looking at Rogers, I could see that we were both wondering the same thing: just what kind of afternoon were we about to encounter? A/1C W. L. Rogers manuevered his Speed Graphic into position, cussing out the shutter which he said "was slippin' on high speed exposures."

I could only hope that his faithful camera would come through. This was one of those unique assignments—a real winner. We didn't dare louse it up. We were about to begin four very unusual hours at Plumtree Island, site of the practice bombing range about five miles northeast of Langley AFB, Va.

The intercom buzzed and our pilot, Capt. Samuel N. Castor, chief of the Langley helicopter section, told us we were landing. He eased the big H-19 down to within about five feet of the ground and seemed to hover there for agonizing moments. We became a bit impatient, wondering why he didn't land.

Could there be unexploded bombs even in this "safe" spot?

Seconds later we landed and Rogers and I learned we were indeed in one of the few safe places in this entire layout of over 900 bomb-infested acres.

"We just might live a few more hours and explore some of this cotton pickin' mess," Rogers observed.

Captain Castor, a veteran 'copter pilot and range officer of this creepy site, ambled back to our seats. "This place is loaded with duds," he warned. "Watch your step whatever you do. A lot of 'em are extremely dangerous."

He didn't have to say anything else. I was ready to clear out of here. No more gripes about the office typewriter or the venerable barracks or the KP pusher. They had never seemed so appealing. Our pilot friend added a choice comment: "We'll probably explode one or two duds."

"Man, did you hear what the captain just said?" I asked Rog.

"Yeah, I heard him," Rogers replied. "Lyon, you take this camera. I'll stay in the chopper."

"Not on your life," I shot back. "I'll stay in this bird, too. Maybe Captain Castor will take the pictures."

A chuckle in the background interrupted our bickering. The other passenger, SSgt. Robert L. Schultz, Langley's demolition specialist, was getting a charge out of all this. "Men, now really, there's no sweat on this deal. Just watch your step and you'll be okay."

Schultz was right. We were out here to do a feature assignment on Plumtree and Shipshoal Islands. The former was acquired by the Army Air Service in 1920, and soon afterwards became a practice target for General Billy Mitchell's Langley-

by A/3C Milton E. Lyon
Langley AFB, Va.

Photos by A/1C W. L. Rogers

Closeup of the Moon? Not quite—but craters from hundreds of bomb explosions create nearly the same weird view.

based Martin bombers.

Since those colorful years of aviation's so-called "Golden Age," and during World War II and Korean conflict training, Plumtree and its sister site, Shipshoal Island, had been plastered by thousands of tons of explosive materials. Also, Plumtree had been used in recent years by Langley's now inactivated 405th Fighter-Bomber Wing and the 345th Bombardment Wing.

Only since last March had the islands known any peace. The 345th gradually eliminated its bomb runs at Plumtree after receiving inactivation orders. Periodically, the base publishes notices about the extreme hazards at both sites. The articles inform the public the islands are loaded with thousands of duds and urge residents in nearby communities to stay out of the area. Parents are particularly warned to keep children out. Now a new publicity twist was suggested: an on-the-spot pictorial story, backed up with good creative copy. That's why we were here.

Only 10 steps out of the chopper and we could already see hundreds of old bombs all around us. Captain Castor and Sergeant Schultz led the way.

Covering about a quarter-mile area in the next two hours, Schultz discovered two "blue fins," 250-pound practice bombs which were extremely dangerous. After brief parleys with Captain Castor, he decided they should be detonated. This, he reasoned, would insure less likelihood of the recurrence of an accident that happened on Plumtree last year.

"These practice bombs," Captain Castor said, "were used until recently by B-57 jet bombers of the 345th Bombardment Wing. They contain a spotting charge of about 10 pounds of black powder and when detonated fling shrapnel-like pieces of metal over a wide area.

"Furthermore," he continued, "thousands of these and high explosive bombs have been dropped on both islands. Some of these did not explode but will still go off if handled improperly."

Sergeant Schultz eagerly led us to the first objective—detonating one of the "blue fins." His confidence unnerved us, at first. We had never seen anyone who liked to tinker so much. Make no mistake, though. Sergeant Schultz had a full understanding of the hazards involved in his task. For him explosive ordnance disposal is a familiar role. He has averaged about one trip per week to Plumtree or Shipshoal since last fall. He is the only demolition specialist at Langley presently authorized to carry out EOD at the islands.

"This is a choice baby to work on," Schultz commented. Turning the bomb slightly, he gently tapped three blocks of C-3 demolition explosive into the fin. With each tap, we chewed off another fingernail, but eased in closer while the sergeant wired up a five-minute fuse to give us ample time to reach a safe distance from the explosion.

More than 75 yards away we waited; the seconds seemed to drag endlessly. The explosion finally ripped off and Rogers caught it beautifully at 1/400th.

This same sequence was repeated as Sergeant Schultz set off the second "blue fin." We had our story. Perhaps, as part of Langley AFB's education campaign, it will help eliminate accidents at either site.

what to do for an encore?

by SMSgt. Hal Bamford

For the dyed-in-the-wool football buff, the departure of 12 lettermen from the 1959 Cotton Bowl squad which battled Texas Christian to a scoreless tie seems to provide an almost insurmountable problem. But in reality, the picture of what to do for an encore may not be nearly as dark as such a blow would indicate.

Gone from the team which compiled an enviable 9-0-2 record last year are such well-known names as Brock Strom, Dave Phillips, Tom Jozwiak, Charlie Rodgers, Giles Wideman, Emil Cwach, Charles Zaleski, John Gulledge, Jay Mitchell, Eddie Rosane, Steve Galios, and Larry Thomson.

Thus the first three games of the 1959 grid schedule may be among the most crucial that school will ever play. Although none of the three opponents—Wyoming, Trinity of Texas and Idaho—rates as a candidate for the mythical national crown, they *will* be tough, because head coach Ben Martin will field a team lacking the all-important element of extensive game experience. Consequently, these three games will serve as the force which either "sets" the squad in the tough form of a year ago or melts it into the class of also-rans.

From October 17 until the last Saturday in November, there'll be no let-up for the Falcons. On successive Saturdays, they will square off with teams which figure to rate well up among the Nation's top elevens—Oregon, UCLA, Army, Missouri, Arizona, New Mexico, and Colorado.

Probably the most pressing line problem centers in the key tackle slots. Four top men including All-American Brock Strom, Cotton Bowl standout Dave Phillips, and their back-ups, Giles Wideman and Emil Cwach, are now on duty as second lieutenants.

Not a single letterman remains to fill a tackle berth—but the picture is not as gloomy as it might appear. The annual spring game uncovered a host of capable youngsters including Bob Wagner, Neal Rountree, Charles Waterman, and Jack Bright, all juniors; and Doug McConnell and Pete Bobko, sophomores.

In that spring game, the coaching staff is convinced they may have found the "sleeper" of the '59 squad in the person of Pete Bobko, a six-two, 208 pound, 19-year-old from Seaford, N. Y. Despite the fact he did not letter last year, Bobko was carried with the varsity squad. As a matter of fact, of the top six prospects this fall, only Jack Bright and Doug McConnell have no previous varsity experience.

Center poses another major problem for Martin and his assistants. Both John Gulledge and Jay Mitchell, the number one and two men of a year ago, have gone. Charles Moores, a junior who won his letter last year, is back, but behind him looms more inexperience.

Top replacement after Moores will probably be Mike Rawlins who lettered in 1958 as a halfback. Only five-eleven, Mike weighs a scant 179 pounds, exceedingly light for the pounding required of a top-flight center. Although he led the squad in rushing average last year with 23.7 yards per try, he carried only four times and gained the majority

of his experience in a defensive role which should stand him in good stead for his new job. Behind Rawlins is a 200-pound sophomore, E. C. Newman.

Martin also said goodbye to two top ends from the '58 squad, Tom Jozwiak and Charlie Rodgers. And inter-mountain west. At five-ten and 185 pounds, Bronson falls in the famed "watch-fob" class, but he is a giant in ability. Paired with him will be Dan Johnson, a senior, and behind them are Randy Cubero, Chris Warack, and Phil Woods, all varsity veterans. Rounding out the John Kuenzel, a southpaw senior letterman, who compiled the highest passing percentage on the squad last year with a 60.8 completion average. Kunzel will probably direct a backfield unit consisting of sophomores Ron Stoner and Don Baucom, and junior Monte Moorberg, who

Mayo *Quinlan* *Bobko* *Bronson* *Moorberg*

while depth again is a problem here, two lettermen remain—Bob Brickey and Sam Hardage. Brickey led all Academy receivers a year ago with 25 catches for 281 yards. Jim Kerr, a senior who has been playing halfback, will be moved into one of the vacated end slots and probably will team with Charles McCain. Behind these two are a pair of promising juniors—Bob Best and Vic Maxwell. The latter quartet has limited varsity experience.

There is one glowing bright spot up front. Martin is knee-deep in classy, experienced guards. Leader among them is the 1959 team captain, already being plugged for All-American honors, Howie Bronson, one of the smallest guards in the top six is Richard Shoof, a promising sophomore.

Problems in the line may be offset by bright spots in the backfield where stick-outs are available in startling numbers.

Tops, of course, is a second All-American candidate, quarterback Rich Mayo. As a sophomore, with no previous college level competition behind him, Mayo finished fourth in the Nation last year with 98 completions in 174 attempts for more than 1,000 yards and 11 touchdowns. Additionally, he is considered one of the better signal callers and field generals and, when he is in the lineup, the team moves.

Martin can call on no less than three letterman veterans to team with Mayo. Included are Mike Quinlan, a junior and the leading scorer of last year's squad; Phil Lane, also a junior; and George Pupich, a senior who has been moved from a halfback to the fullback slot. Pupich barely missed setting a national collegiate field goal record last fall when he successfully converted five three-point attempts and had two others bounce off the crossbar. These three all carry a four-plus-yard per try rushing average from a year ago—impressive figures in any league.

Behind Mayo, at quarterback, is was most impressive in the spring game.

John Goodly, a junior; Don Hallager and Robert Staib, sophomores; and Bill Zersen, a senior, also figure prominently in backfield plans.

Many of the '59 candidates got their baptism of fire under intra-squad conditions early this spring. The coaching staff was enthusiastic about the showing of some of the newcomers, as well as most of the veterans, in the 14-14 tie played in April at the end of spring practice.

In addition to Pete Bobko, who caught everyone's eye, sophomore halfbacks Baucom and Hallager rated more than the normal share of raves. Mike Rawlins, the converted halfback, exceeded expectations in his new role at center. And veterans Pupich, Brickey, Quinlan, Lane, and Hardage had spectator eyes popping.

Of course, success has its drawbacks as any Notre Dame alumni is able to attest. Being unbeaten and rated among the Nation's top ten a year ago puts the extra pressure of having all opposition gunning for an upset on the shoulders of the current crew.

If they can get by those first few games, jell as a unit, and gain that all-important game experience the Falcons could well be among the Nation's best again in 1959.

1959 USAFA SCHEDULE

DATE	OPPONENT AND SITE	1958 SCORE
Sept. 26	Wyoming at Laramie	21- 6
Oct. 3*	Trinity at San Antonio	— —
Oct. 10	Idaho at Denver	— —
Oct. 17	Oregon at Portland	— —
Oct. 23*	UCLA at Los Angeles	— —
Oct. 31	Army at New York City	— —
Nov. 7	Missouri at Columbia	— —
Nov. 14	Arizona at Boulder	— —
Nov. 21	New Mexico at Denver	45- 7
Nov. 28	Colorado at Boulder	20-14

* Indicates night game

WINDOW of the MISSILE WORLD

by John Demeter, *AFBMD*

THE lumpy, brush-studded Santa Susanna Mountains, rising 2,500 feet above Canoga Park in California's teeming San Fernando Valley, once were a popular setting for the filming of Hollywood horse operas. The climate, scenery, and emptiness of the land—just 25 miles from the heart of filmland—embody for camera crews the flair and flavor of the Wild West.

Stage trails still track the crests of these picturesque hills, but they show few signs of recent use. Now a busy blacktop roadway curls up the western face of the rock-strewn mountains. There are other changes.

The bold, ear-blistering. thunder of raw power, harnessed to the greatest "bullet" ever made, has drowned yesterday's timid cracks of blank cartridges; and tucked into Susy's ridges are 18 steel and concrete towers. Every day, from one or more of these derrick-like structures, plumes of liquid oxygen, clouds of steam, funace-hot tongues of flame, billows of smoke, and violent blasts of sound greater than the roar of a hundred jet engines identify the captive testing of mighty ballistic missile rocket engines.

Here is North American Aviation's Rocketdyne engine test facility.

On certain days each month, groups of some 35 Air Force officers and civilians—student-guests of the Air Force Ballistic Missile Division's Air University educational staff—climb to craggy observation points, don incongruous-looking "hard" hats, and wait for the siren that warns of another test firing.

In the less than five years since the Ballistic Missile Division was established as the Western Development Division of ARDC, the *Thor, Atlas,* and *Titan* ballistic missiles have progressed from blueprint theories to workable hardware, and the greatly advanced concept which is *Minuteman* has evolved.

Here, where the actual development work is done, the Air University staff conducts its effective orientation course.

Sessions are devoted to each of the major weapon systems—*Thor, Atlas, Titan,* and *Minuteman.* The science of trajectories is traced; warheads and re-entry vehicles are discussed; ground-support equipment is described; training programs, the signifiance of human engineering, and problems of base selection are explained. There are provocative accounts of space probes and space systems along with stimulating explanations of antimissile theories.

Yet with only 24 lecture hours, surfaces can be barely scratched on technical subjects virtually infinite in detail. Also, since missile technology has generated a vocabulary of its own, a 15-page glossary of terms is provided to each student officer.

The BMD orientation course grew out of a need. Back in late 1955, rockets and ballistic weapons were largely the province of the scientific few, and developments were breaking faster than laymen could follow.

The course is their introduction to the research, development, and perfection of ballistic missile weapon systems. During the five-day Air University missile orientation course, selected officers experience the sights and sounds of modern missilery; they look into rocket engine components in Rocketdyne's Canoga Park shops, tour the *Thor* production line at the Douglas Santa Monica plant, count the shiny silver *Atlas* missiles

Students view the steel and concrete test stands of Rocketdyne's engine test facility.

in their checkout berths at Convair Astronautics' San Diego facility, and soak up two dozen hours of missile and space information fed to them through lecture, demonstration, film slide, and motion picture.

The course affords an introduction to the Nation's highest military priority program, and to its managing organization—Air Research and Development Command's Ballistic Missile Division.

The division itself is unique as an Air Force organization.

Physically not a military base at all, BMD is nested in a complex of 13 low-slung office buildings in southwest Los Angeles' bustling aviation district. Sharing the site is the Space Technology Laboratories —the civilian firm which furnishes technical direction and systems engineering to the ballistic missile programs.

Fused into the complexion of the Ballistic Missile Division are other vital elements. In addition to the central core of ARDC people, there are personnel from the Air Materiel Command, and Strategic Air Command.

In command of BMD is Maj. Gen. O. J. Ritland, newly named successor to Lt. Gen. Bernard A. Schriever, first BMD chief who is now commander of ARDC.

At the Air University headquarters in Alabama, Lt. Gen. D. C. Strother, then the AU Commander, suggested to General Schriever that their two organizations establish a mutual exchange program. Instructors in the weapons courses conducted by the University needed up-to-date technical information; General Schriever needed academic-type people to capture the dynamic events rapidly shaping weapon concept history.

One result of that meeting was the establishment of the Ballistic Systems Education Division which, since February 1956, has provided edification and enlightment for some 15,000 persons.

At the outset, three Air University staff officers were assigned to the Air University's BSED office at the Ballistic Missile Division to provide current technically accurate information to the Air University. Today, the unit has 12 officers, and the present programs of orientation and familiarization are happy by-products of the original idea.

Lt. Col. Byron E. McMahon, AU chief of BSED since its inception, emphasizes the importance of career officers keeping abreast of the new technologies.

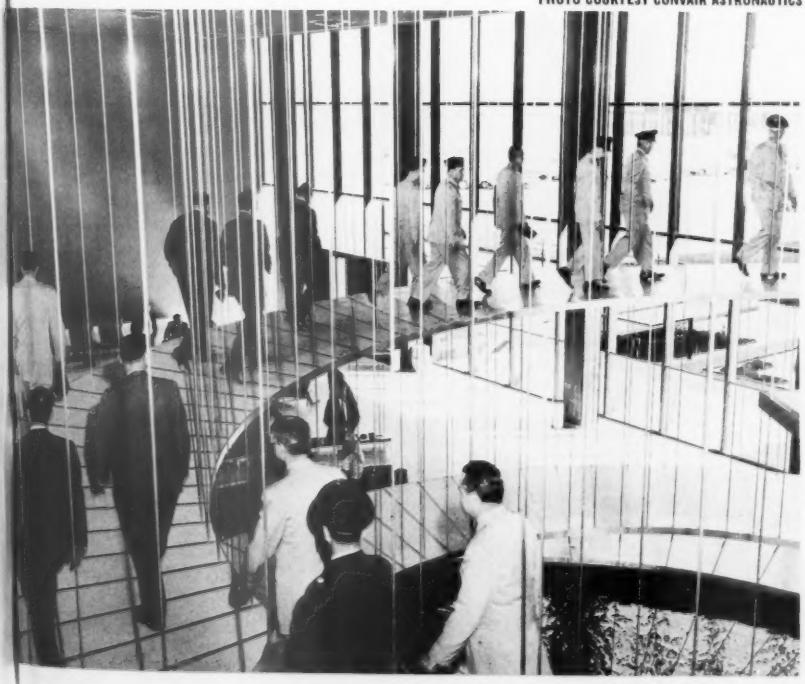
"We're giving a lot of military people who *should* know at least a skeleton of information on what ballistic missiles are, and an idea of what their influences on the Air Force of tomorrow will be," he says. It's fairly apparent, the staff feels, that missiles and related space system applications represent the weapon concepts of the future.

While the Ballistic Systems Education Division was still in its embryonic stage, numerous urgent pleas for "quick facts" on ballistic missile subjects began to arrive from a number of military agencies and commands.

Today unfamiliarity in key places has long since disappeared. The Air University staff on duty at BMD has settled down to a continuing, concentrated effort to paint the ballistic missile picture for the Air Force in general, with as broad a brush as possible.

The first of the present series of orientation courses was held in August, 1957. Since that time there has been an average of two week-long programs a month. Like the missile program, the course is not a static thing; in fact, no two curricula are ever exactly the same. Instructors keep in touch with the experts on missile art, and lectures are up-

PHOTO COURTESY CONVAIR ASTRONAUTICS



Air Force "student" officers visit the ultra-modern Convair Astronautics plant in San Diego where the Atlas *intercontinental ballistic missile is assembled.*

WINDOW of the MISSILE WORLD

dated accordingly. Visual aids are as current as the daily newspaper. Students critique the course and comments, though overwhelming favorable, frequently yield suggestions which are applied toward future courses.

Usually individuals don't repeat the course, but officers directly in missile work occasionally do. These few have found the second experience not repetitious, but rewarding —an indication of the accelerated pace of missile technologies.

There is seldom an empty seat in the Air University's recently enlarged orientation theater. Ballistic missiles are subjects of insatiable curiosity. Course quotas, consequently, are in heavy demand. Attendance quotas are assigned to each command, and individual sessions now are generally booked three to four months in advance.

"We have few, if any, 'quota fillers,' " Colonel McMahon says. "The officers selected to attend—and we have had representatives of all ranks from warrant officer up through major general—are chosen carefully on the basis of assignment, abilities, and, most important, 'need to know.' "

Thor *missiles in various stages of production and assembly are shown to Air Force officers chosen to participate in the Ballistic Missile Division orientation program.* PHOTO COURTESY OF DOUGLAS AIRCRAFT

by Dave Karten

PICTURES on these pages tell the story.

The cross section of Air Force Activities shown here was photographed by the skilled cameramen and technicians of MATS' Air Photographic and Charting Service, with headquarters at Orlando AFB, Fla.

On call 24 hours a day, APCS camera crews document important military operations, cover USAF missile firings, film events of news and historical significance. Their script: the global day-to-day Air Force operations. Their sound stage: the world.

When American Marines went into Lebanon during the Middle East alert in July 1958, APCS cameramen flown in from Wiesbaden, Germany, filmed the landings. Within 24 hours the film was processed in Europe, rushed to Washington for review and public release.

Every time an Air Force missile slices into space from Canaveral or Vandenberg, APCS cameras record the operation:

When the missile lifts off the launch pad, 20 remote-controlled, special lens, high speed Fairchild movie cameras, strategically mounted five to 2,500 feet from blast point, record the operation at 200 frames per second.

As the "bird" starts to climb, 15 APCS cameramen, stationed at safe vantage points beyond the 2,500-foot mark, lock sharply focused tracking cameras on the space-bound missile's path. Their cameras record the slightest deviations; report on shockwave formations in the rocket engine exhaust; stability of the airframe, exhaust flame turbulence and action in thin atmospheres. Such visually obtained technical information supplements electronically obtained data and both make corrections and refinements possible.

In a matter of hours APCS lab technicians process 4,000 feet of color and black and white film, edit it, and speed the movies and stills to the Pentagon for careful study. Close another "take" for the professional photographers of Air Photographic and Charting Service.

Their speed and efficiency have earned APCS cameramen praise from the national press during the launching of *Discoverer I* from Vandenberg AFB. The professional cameramen of the 1352d Motion Picture Squadron—working out of the Air Force's Lookout Mountain Laboratory, Calif., furnished the wire services with still photos of the launching 30 minutes after the rocket left the pad.

But filming test firings of tomorrow's weapons is only one of many important assignments handled by APCS camera crews. Other crews keep a film record of progress in the development of advanced new air weapons by Air Research and Development Command. And APCS-produced ARDC staff reports, often dealing with highly classified subjects, are regularly viewed by top defense officials.

Not as glamorous but perhaps equally as important are the numerous training films produced by APCS on subjects ranging from gunnery to electronics which make complicated techniques easy to understand,

monthly Air Force newsreels, and feature films produced by APCS and APCS-supervised commercial firms.

For special production movies the organization's modern studios at Orlando, Fla., and Hollywood, Calif., are manned by experienced directors, producers, and screen writers backed by airmen who are skilled motion picture technicians. This combination has turned out many quality films. A feature on "The Thunderbirds" received special mention at the Berlin, Venice, and Edinburgh International Film Festivals. An APCS-produced ground safety film earned a citation for pictorial excellence from the National Safety Council. APCS won the Air Force Association's Arts and Letters Trophy for 1958.

Volume one of "The Air Force Story," the APCS-produced history of airpower, is currently being screened by more than 150 TV stations. Volume two, which portrays USAF history up to the space age, is now in production.

A quarterly "Safety Report" produced by Air Photographic and Charting Service frequently requires its cameramen to take calculated risks to "get the picture." Working with the Atomic Energy Commission, for example, APCS cameramen on the scene of major atomic and hydrogen weapon tests have overcome hazards and difficult problems in filming lethal-but-photogenic mushrooming blasts. Not long ago an APCS cameraman stood at "ground zero" with five volunteer Air Force officers beneath an explosion of the atomic *Genie* air-to-air missile. He got the picture.

During seven years of its existence, APCS cameramen have faithfully recorded just about all the major developments in the Air Force. Their consistently outstanding photographs have opened the eyes of thousands to the wide range of Air Force activities.

"Today," says APCS Commander, Brig. Gen. Clifford E. Rees, "the missile and space age Air Force is placing new demands on the old tried and true photographic methods. Space, mankind's last great frontier, is basically dependent upon electronic and photographic methods to determine whether or not it will be conquered. Our cameramen are keeping pace by working hand-in-hand with the photographic industry in perfecting space age photography."

Tomorrow? The first cameraman on the moon may well be an APCS man.

Every time an Air Force missile slices into space from Canaveral or Vandenberg, APCS cameras record the operation.

In minus 40 degree temperatures and hip deep snow APCS photographers film Air Force operations up north.

Braced against the detonation shockwave APCS cameramen record an Atomic Energy Commission test.

Cameramen on training film assignment in England shoot the business end of a jet while RAF men look on with interest.

In tropical Panama an APCS team, in appropriate costume, shoots a jungle survival training film.

THE TAMING of the ATOM

by TSgt. John K. O'Doherty

LIKE a bright little island of Air Force blue floating in an ocean of Army green, the 3270th Technical Training Squadron (DA) conducts its business right on the premises at Fort Belvoir, Virginia. Situated about 20 miles south of Washington, D. C.—and once, incidentally, commanded by Maj. Gen. Mason M. Patrick of the Air Service—Fort Belvoir is the 10,000-acre home of The Engineer School, an Army training facility which offers instruction in more than a score of military specialties.

The 3270th, a compact little unit with a permanent-party strength of about 40 men, is the administrative vehicle by which numbers of Air Force personnel are conveyed through training courses in skills used by both services. The squadron, in addition, supports The Engineer School by providing a number of Air Force instructors in a variety of fields.

As a component of the 3345th Technical School, USAF, of Chanute AFB, Ill., the 3270th has been living with the Army at Fort Belvoir since 1950. During the years of its operation, many young airmen fresh from Lackland have joined the squadron for a few weeks or a few months to absorb training in such areas as equipment maintenance, refrigeration, surveying, drafting, and printing. The Age of the Atom caught up with the 3270th in March of 1958 when the Nuclear Power Plant Operator's Course was added to those offered by The Engineer School. The Nuclear Power Plant Operator's Course is developed and conducted by the Nuclear Power Field Office under direct supervision of the Chief of Engineers. The mission of the little 3270th immediately blossomed forth into a new and dramatic significance.

Military interest in harnessing nuclear energy for the production of heat and electricity dates back over a number of years, particularly since increasing numbers of isolated installations have posed greater and greater logistical problems. For many military bases—especially in the Arctic—the supply of fuel for heat and electric power accounts for as much as 70 to 80 percent of the logistic effort. The price of fuel for diesel generators, a little over 10 cents a gallon in metropolitan United States, may soar to as much as $1.50 per gallon or more when delivered by air to a site north of the 65th parallel.

In 1953, following a series of studies conducted during the previous year, a joint organization was established to coordinate the activities of the Department of Defense and the Atomic Energy Commission in developing a nuclear power program for the military services. Construction of the first pilot plant developed under this arrangement was begun at Fort Belvoir in 1955.

Since the Corps of Engineers of the Army was assigned a large responsibility in the area of construction, and the Chief of Engineers was designated responsible agent for

The wild horse of nuclear energy—formerly identified only with violence and destruction—is now broken to the harness of a broader usefulness. Today, 21 airmen comprise the entire enlisted strength of a new Air Force career field which promises to revolutionize logistical systems. In the near future, just around the corner of tomorrow, nuclear energy will be employed to provide heat and energy for air defense stations and other isolated military communities.

And it is not unlikely that the efforts of the military avant-garde *in this new field will do even more for the future of civilian industrial progress than the B-29 did for commercial aviation.*

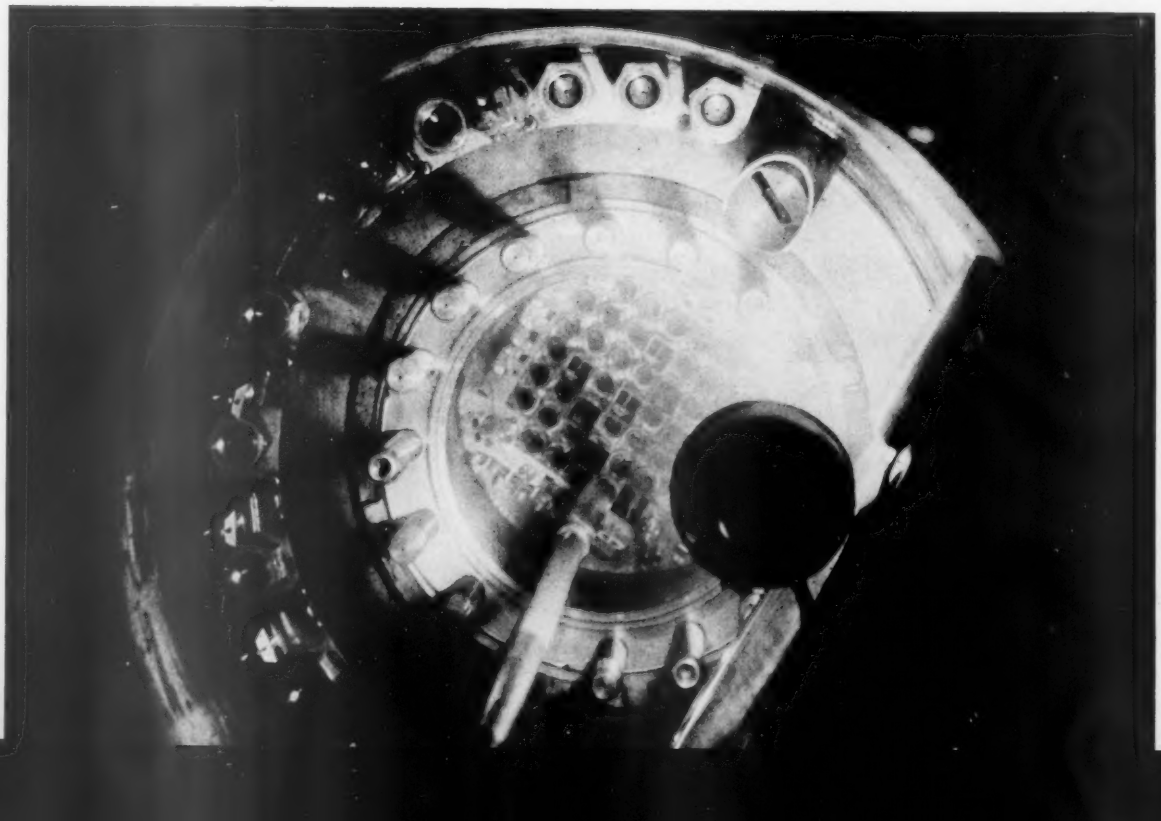
development of suitable reactors with the Atomic Energy Commission, the program became known as the Army Nuclear Power Program (ANPP). The organization is, however, a tri-service structure concerned with the nuclear-energy requirements of all military departments with respect to heat, electricity, and—in the future—propulsion for land vehicles. Technical personnel from the three services work together in exploring avenues of possibility and in translating the visions of scientists into plans for practical hardware.

The nuclear power plant now in operation at Fort Belvoir is the first prototype of a family of nuclear reactors under development by ANPP. Actual construction took 18 months, and the first electricity was generated on April 15, 1957.

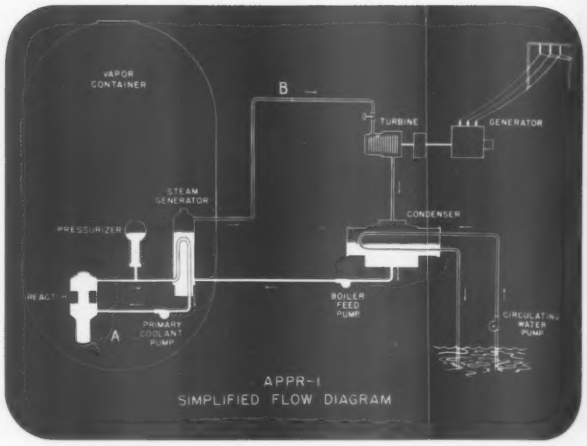
The cadre of military personnel selected to operate the plant was drawn from all three services. This original group included six Air Force noncommissioned officers, and the handful of pioneers reported in after receiving advance training at civilian universities, at the Oak Ridge National Laboratory of the Atomic Energy Commission, or the test facility operated by the contracting company, Alco Products, Inc.

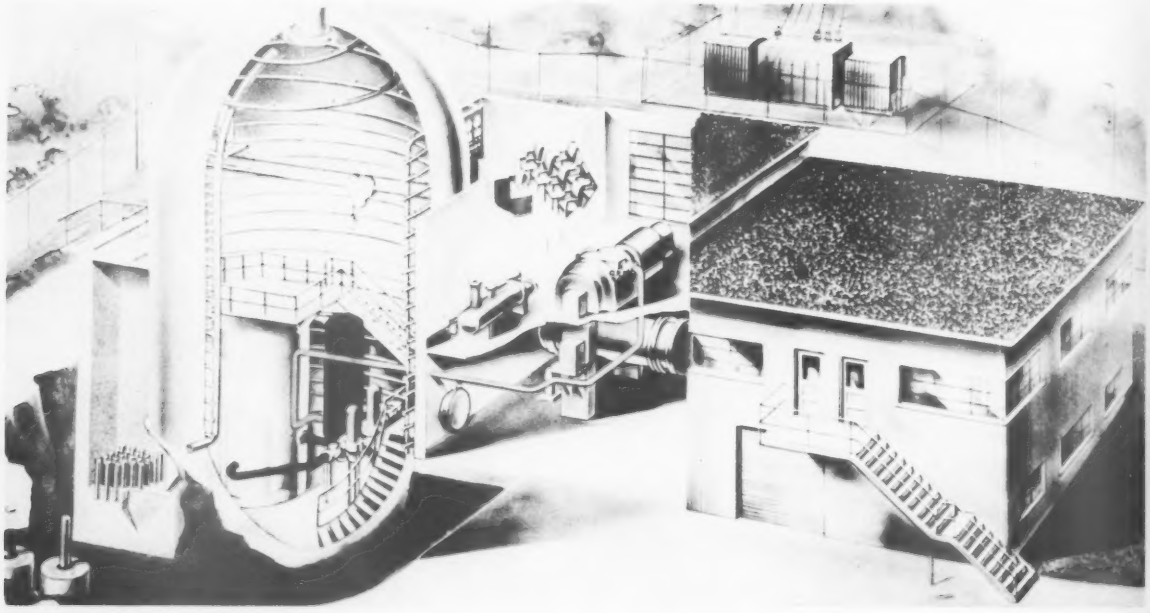
Official designation of the Fort Belvoir plant is APPR-1, for Army Package Power Reactor. The term "package power" derives from the fact that components are designed to be transported by air if necessary, and an entire plant of this type could be reassembled at a remote location in a period of about four months. The plant produces 1,855 kilowatts of electricity, which is approximately sufficient for a community of 2,000 persons.

Through a barrier of 12 feet of water the reactor core can be seen resting in its shield of steel and concrete



APPR-1 uses the "pressurized water" concept so successfully proven in thousands of miles of operation of the submarine Nautilus. Water under pressure of 1,200 lbs. per square inch circulates through the reactor at the rate of 4,000 gallons per minute (Line A), where it is heated to 450° Fahrenheit. From the reactor this heated water passes to a heat exchanger where heat is transferred to a secondary, independent water system. Water in the primary system returns to the reactor for reheating. Steam generated in the secondary system (Line B) circulates to activate the turbine in the manner of a conventional plant.





The key component of APPR-1 is the nuclear reactor with its core of 38 fuel elements containing fully enriched uranium.

Primary shielding for the reactor consists of eight concentric stainless steel cylinders resting in a tank of water surrounding the vessel. Additional shielding against radiation is provided by five feet of concrete, forming the walls of the "vapor chamber," a structure of combination steel and concrete 36 feet in diameter by 64 feet in height. (It is generally recognized that safety precautions incorporated in the design of APPR-1 are probably in excess of any operational requirement in the field. Experience may indicate that some of these features can be safely eliminated in future models.)

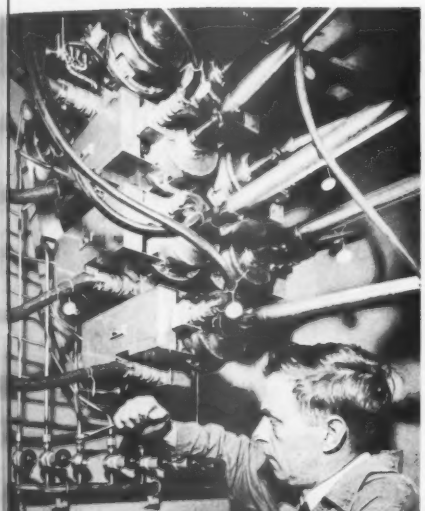
The energy created by fission of uranium dioxide in the core is expected to produce 2,600,000 kilowatts of electricity for one pound of enriched uranium. A standard diesel generator will produce only about one and a half kilowatts per pound of fuel. The consumption of uranium fuel in APPR-1 under normal operating conditions is estimated at 11 pounds annually. During the same period a comparable diesel plant will consume about 50,000 barrels of oil. The concentrated heat provided by the nuclear system is so great that engineers estimate that 24 million pounds of coal would be required to generate the equivalent amount of heat in a year.

It has been determined that APPR-1 can operate for a year and a half or more without refueling,

and the replacement component required at the end of that time weighs only 800 pounds, a load well within the capability of a C-47 aircraft.

In addition to APPR-1 at Fort Belvoir, a number of other projects are in varying stages of development in the military nuclear power program. In August of 1958 the Atomic Energy Commission began test operations on the Argonne Low Power Reactor at the National Reactor Testing Station in Idaho. This plant is designed to meet the needs of a small, isolated detachment. Its function will be to provide power for radar equipment and heat for adjacent offices and quarters. The plant can be easily transported by air, and can be set up anywhere without elaborate preparatory work. The output is a relatively modest 300 kilowatts of electricity with about 15 percent of the steam generated being detoured to provide space heat.

A third plant, similar in design to APPR-1 at Fort Belvoir, is scheduled to become operational at Fort Greely, Alaska, in mid-1960. This plant will supply heat and power for the installation there, and will provide an operating test under extreme weather conditions. The thermal output of the Fort Greely plant will be nearly double that of Belvoir.



A technician makes an adjustment on the control rod mechanism at APPR-1. The seven control rods, operated from a remote console, manipulate the fuel elements which rest in the core of the reactor.

Two cranes were required to lower the reactor vessel into the vapor chamber at APPR-1. Clearance at the top during this delicate and tricky maneuver was about one inch. Reactor vessel weighs 31,600 pounds.

The first nuclear power plant intended for exclusive use by the Air Force is designated PM-1, and is now under design by the Martin Co. of Baltimore. (The PM is for *Portable* components and *Medium* capacity.) PM-1 will use the pressurized water method and will have a capacity greater than the low power Argonne reactor in Idaho but less than that of Greely's APPR-1a.

The Air Force plant will use factory-assembled modules which can be transported by C-130 aircraft and connected at the site—and which may be picked up and relocated elsewhere if necessary. When PM-1 is completed it will be installed and placed in operation in the fall of 1961 at a new AC&W site of the Air Defense Command at Sundance, Wyoming. The location of the Sundance site in the northeast corner of the state—a sparsely inhabited, mountainous area 6,600 feet above sea level—offers a logistical challenge for which nuclear power supplies a neat and efficient solution.

But where are the Air Force technicians, skilled in the intricacies of nuclear power, who must operate and maintain the string of nuclear power plants that can be expected to sprout like mushrooms in the years immediately ahead? This is where the diminutive 3270th squadron and its training mission fit into the picture.

The original cadre of Army, Navy, and Air Force personnel which reported to Fort Belvoir in the spring of 1956 included six Air Force noncommisisoned officers, two Air Force commissioned officers, and one warrant officer. The entire group worked with the contractor technicians in the task of arriving at operational readiness, and participated, with the contractor personnel, in a six-month test operation in 1957. At the same time, the groundwork was laid for the program of military training in nuclear power plant operation.

Air Force instructor MSgt. Robert E. Allen supervises the work of three students operating the simulator console at Fort Belvoir school.

By the time the facility was officially accepted from the contractor, training requirements had begun to assume recognizable proportions, and in September 1957 six additional Air Force men reported to the 3270th as candidates for instruction. A second tri-service class was accepted in January 1959 including 10 Air Force NCOs, and when this group is graduated the Air Force will have 21 enlisted men qualified in industrial employment of nuclear energy. (Of these 21 men, three came into the Air Force program by way of a side entrance. They are Navy veterans of the submarine *Seawolf* who switched from Navy blue to Air Force blue at the end of an enlistment—without loss of rank.)

The course of instruction developed by the tri-service faculty at Fort Belvoir extends over a year of concentrated study. It is a rigorous program entailing assiduous application of the nose to the grindstone, but, as a result of the meticulousness exercised in the selection process, no student to date has washed out or fallen by the wayside.

The academic phase of the course occupies the first 16 weeks, or 640 class-hours. In terms of time devoted to various subjects, electrical engineering heads the list with 99 hours; followed by nuclear engineering, 87 hours; mathematics, 75 hours; physics, 74 hours; and several other categories of subject matter in varying proportions. One of the most important of these academic components is the category labeled "Health Physics," which—in a nutshell—is the science dealing with radioactivity, its cause and effect, and the precautions which must be observed in guarding against its dangers.

Following the conquest of this formidable initiation into the world of nucleonics, students move along into specialty training, in which some 400 hours are devoted to maintenance of electrical and electronic equipment, chemical analysis of water and air, control of radiation areas, and procedures for coping with contaminated matter in emergencies. The final four months of the course are occupied in actual operation and maintenance of the plant, under supervision.

In September of 1959 the Air Force will initiate training for the second generation of nuclear power plant specialists when six men in the rank of airman first class will be assigned to the 3270th for training at Fort Belvoir. These airmen, all volunteer applicants screened on the basis of education, aptitude, physical characteristics, military status, and personal character, will receive the same highly concentrated training provided for the noncommissioned officer groups which preceded them. Upon successful completion of the course they will be awarded AFSC 002X0, the interim designation assigned to the new career field.

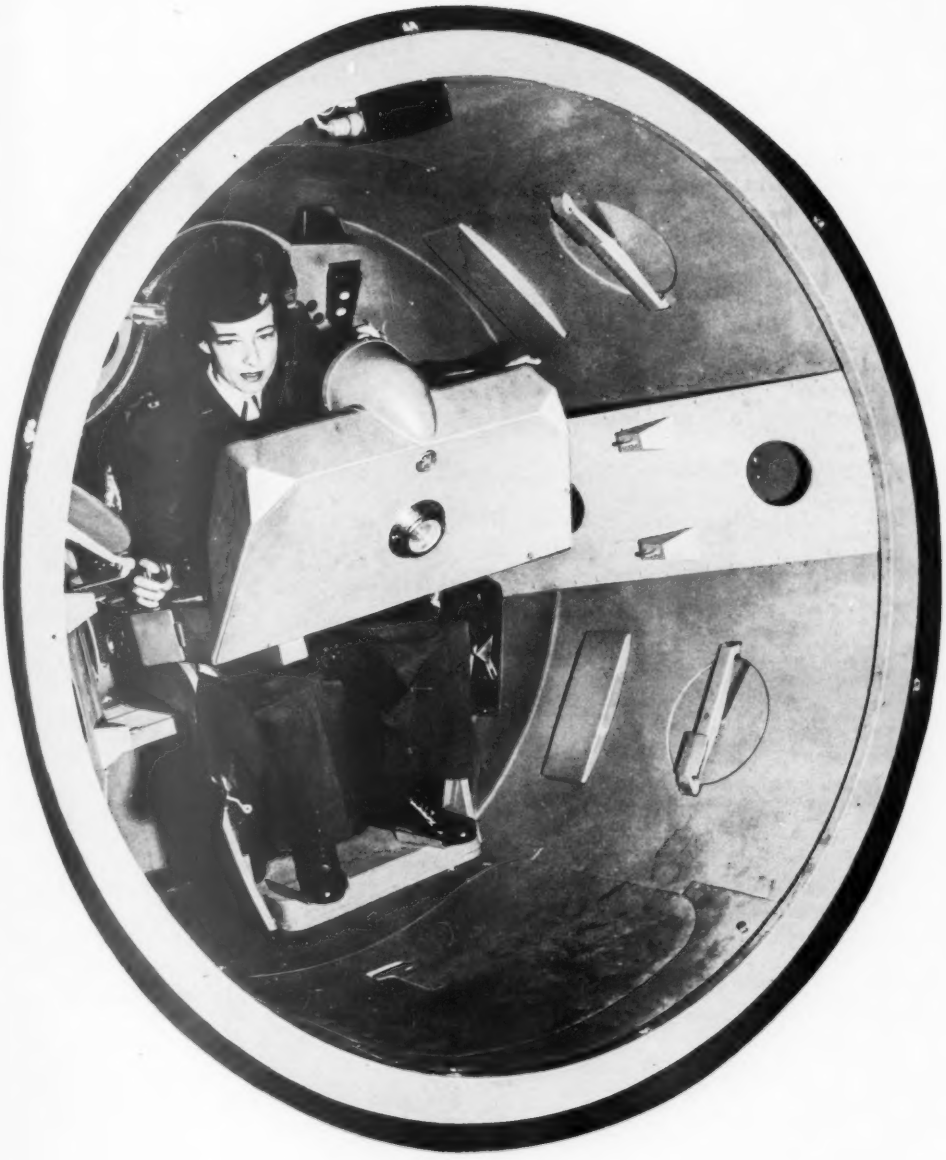
Six additional junior airmen will be selected to begin training in the spring of 1960. Thus by early 1961, several months in advance of the operational target date for the Sundance installation, the Air Force will have 33 men trained to all required levels of proficiency.

A tentative Air Force manning table prepared at the Fort Belvoir school proposes a crew of 16 enlisted men under a warrant officer plant supervisor as the manpower requirement for a typical nuclear power installation. Experience may justify reduction of this figure. Progression up the ladder will follow the regular pattern of OJT, and proficiency pay is authorized at all levels when preliminary schooling is completed.

How big can the nuclear power program become? Air defense sites such as AC&W and Dew line installations offer the most immediate and logical opportunities for application in view of the logistical problems involved. But considering the role that oil has played in military science during the past 50 years, the possibilities contained in employment of nuclear energy assume a significance which strains the imagination—particularly as the day of reckoning must eventually be faced with respect to the world's oil reserves.

As research programs such as ANPP continue to reap a harvest of accomplishment the horizon of usefulness will broaden far beyond the range of present visibility. Military implications are only the beginning, and from the proving ground of military experience the answers to a hundred problems of the future may emerge.

Capt. James W. Alexander, commander of the 3270th Technical Training Squadron, looks at the situation like this. "We are standing on the ground floor of a program which may eventually assume a significance as great as the Industrial Revolution. The possibilities are beyond the range of our vision at present. Our experience in this particular field of technical training is limited, and, unquestionably, we will encounter obstacles and problems which must be met and overcome as they develop. The men we are training today are the pioneers in a field of endeavor which opens an entire new vista in human experience."



See WAFs, Women, and Wings, page 32

AIRMAN'S WORLD

Briefs from USAF, world wide

WAFs, Women, and Wings

This month the ladies made news!

The intent, space-bound female, pictured on page 31, is Maj. Adele Ball, Chief of the Nurse/Medical Specialist Personnel Procurement Division, USAF Recruiting Service.

Her interest is centered on features of the newly developed space capsule being tested at Wright-Patterson AFB. It is designed to withstand a 20-foot-per-second impact without injuring the occupant, floats, and can sustain a passenger for 48 hours.

But Major Ball was not the lone lady to make USAF headlines recently.

At Yokota AB, Japan, Capt. Yvonne Pateman, OIC, 41st Air Division Target Intelligence Center, while not space bound, is doing her bit to cement relations with local personnel.

Utilizing her vast flying experience, Captain Pateman is active in the Yokota Aero Club and spends many hours instructing fellow aviation enthusiasts, both American and Japanese.

Her qualifications are more than adequate. Since winning her wings, she has logged more than 4,000 hours; is a veteran of the WASPs, famed in WW II; is a former ferry pilot; and currently a member of the renowned "99s," an international organization of women pilots, founded by the late Amelia Earhart.

Another member of this same organization was a recent guest of the 79th Fighter Group at Youngstown Municipal Airport, Ohio.

Past-president of the same organization, Mrs. Jody Scott, now a race committee chairman for the equally famed Powder Puff Derby, visited Youngstown, a scheduled stop on the annual cross-country dash.

There she was briefed on military air-space requirements at the station so that she, in turn, could brief other participants, thus avoiding complications in air traffic which might otherwise arise at the busy, combined Air Defense Command-civilian airport.

Freedom Fighter

The prototype of Northrop's N-156F *Freedom Fighter*, scheduled for flight-testing this summer, recently rolled off the assembly line.

Designed to meet economical air defense needs at NATO, SEATO, and other allied nations, the lightweight, all-weather, multipurpose fighter was developed in parallel with USAF's new T-38 supersonic jet trainer.

U. S. funds and technology were applied to its design and development. Allied governments scheduled to receive the new fighter will later produce the aircraft locally.

Much of the T-38 design and wind tunnel data were applied to N-156F development, and there is a maximum interchangeability of parts between the two planes.

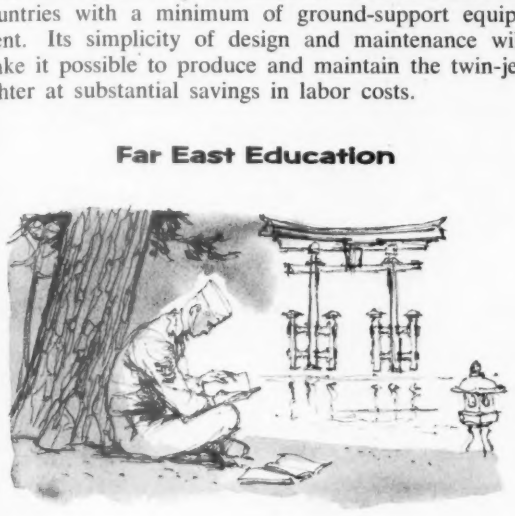
Capable of Mach 2 speeds even when armed with

SEEING DOUBLE. Twins are usually associated with confusion of one kind or another, but this cool pair stays "unconfused" by reading THE AIRMAN. 1st Lt. Lyn R. Officer (right, or is he left?) and 1st Lt. Upton D. Officer (multiple choice, left or right) are both assigned to the 3552d Training Squadron at Moody AFB, Ga. This picture of the officer Officers was taken in the office of one of the officers. Pity the poor correspondence clerk who must address letters to the two officer Officers. After typing the word "subject," he must determine to which of the two the "to" is directed to, too. (Too true!)

The Airman

bombs or air-to-air missiles, the N-156F can operate from the short runways common in NATO and SEATO countries with a minimum of ground-support equipment. Its simplicity of design and maintenance will make it possible to produce and maintain the twin-jet fighter at substantial savings in labor costs.

Far East Education



A growing interest in education within the USAF is indicated from recent figures released by the 5th Air Force.

They show that nearly 1,500 airmen in the 5th AF area are devoting more than six hours per week to university studies. Although personnel strength figures have declined class attendance continues to climb.

Since the University of Maryland came to Japan three years ago more than 37,000 all-service enrollments have been recorded. Half of these are Air Force personnel. Despite transfers and TDY, the completion rate continues to remain around the 90 percent level.

Scholarships and Fellowships

Officials in Hqs USAF have dispatched a clarifying message to the field about AFR 36-95 concerning applications for and acceptance of scholarships and fellowships by Air Force officers.

When several details in the original regulation led to confusion a new message was prepared to clarify these misunderstandings.

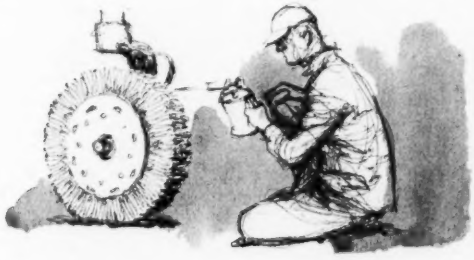
For example, while the major command of assignment may recommend approval for an officer desiring such an award, in no instance may either the command or individual accept assistance without prior approval of USAF headquarters.

Normally, the monetary grant is expected to cover both tuition and required fees. However, in specific cases where this is not enough, it is possible to receive supplemental Air Force funds when they are available from the Air University.

The message also touches other details and officers intending to apply for educational assistance should read the basic regulation and supplemental message. Details are available to prospective applicants through their personnel offices.

Flatproof

Tests are being conducted at the NASA laboratory, Langley AFB, Va., on a new type tire, developed by Goodyear for use on space vehicles. The tire contains no rubber, no fabric, and no air, and offers a possible solution to the problem of rubber tires melting when a space vehicle passes through the thermal thicket upon reentry.



Built to withstand temperatures ranging from 1,000 to 2,000 degrees, Fahrenheit, the tire is constructed entirely of wire. In appearance, it is similar to a common wire brush or a workshop wheel. It has load-deflection characteristics comparable to those of pneumatic tires, a higher rolling resistance for easier braking action and, quite naturally, is blowout proof.

In addition to its advantages over rubber tires, it also boasts an edge over standard skid pads, a previous attempted solution to this heat problem. The wire tire has greater ability to absorb landing impact and runway irregularities, greater total contact area, better surface cooling properties, and increased directional stability.

Current Langley tests are a follow-up of those conducted by Goodyear in their own laboratories.

Very Special Delivery

Military postal service has long been one of the primary morale services for the troops, as well as a vital means of transmission for official communications and supplies.

Now, the accelerated pace of the Air Force missile

development has cast the Army and Air Force Postal Service in a new role: support of Air Force missile deployment through a uniquie postal operation.

USAF, with the cooperation of the U. S. Post Office Department, has initiated "Mercury Able," a direct expedite pouch service between the Ballistic Missile Division and missile contractors in Los Angeles and between BMD and contractor activities in England. Arrangements were made with the Ballistic Missile Division, Space Technology Laboratories, San Bernardino Air Material Area, and prime cilivian contractors—Douglas Aircraft and Rocketdyne—to consolidate in the Los Angeles area, all small supply items, the "black boxes," the communications and technical publications needed to support the missile program.

All this material was dispatched daily by direct expedite mail pouch to England. At London, the local APO picked up the pouches upon arrival and delivered them immediately to the AFBMD liaison officer, contractor representatives, or missile sites.

The Army and Air Force Postal Service has had spectacular success in transmitting the pouches from Los Angeles to London. Initially the polar route proved to be the fastest and most reliable with a point-to-point transit time of 20 hours. Now, with the advent of Pan-American trans-Atlantic jet service and American Airlines nonstop jet service from Los Angeles to New York, the transit time has been reduced to 14 hours.

A similar pouch service has been inaugurated between Los Angeles and Patrick AFB, Fla., to speed transmission of missile firing tapes from Cape Canaveral to AFBMD and Space Technology Laboratories in Los Angeles. This permits analysis of firing tapes to determine missile performance within a minimum number of hours after each firing. Pouch service also takes care of other mail between the two activities.

Besides special expedite pouch services which support specific weapon systems, direct pouches are used extensively by most commands to expedite transmission of communications between their bases and other commands.

Bits of Blue

. . . War against private motor vehicle accidents showed that fatalities, disabling injuries, man-days lost, and resultant costs dropped sharply during the first quarter of this year compared with the same period of 1958. Fatalities decreased more than 21 percent when the figure diminished from 129 deaths to 101.

. . . The Post Office Department recently assumed operation of former USAF-operated APOs at Andersen AFB, Guam, and Ramey AFB, Puerto Rico, saving the Air Force 29 manpower spaces. APO numbers and mailing addresses will remain as they were and carrier delivery will be extended to family housing on the stations.

. . . New and revised APTs will be utilized in the December '59 and January '60 testing cycles in the 30 (Radio-Radar Systems) and 46 (Munitions and Weapons Maintenance) career fields.

. . . One of the first Japanese technical publications on space medicine, *Medicine and the Stars*, has been dedicated to Dr. Hubertus Strughold of USAF's School of Aviation Medicine.

FIRST FULL CLASS of 748 cadets is shown as it was sworn in late in June at the United States Air Force Academy, Colorado Springs, Colo. These men will begin classes on September 2 after a full summer of intensive military training and physical conditioning. First and second classmen (seniors and juniors) served as instructors during the rugged nine-week training period. Of the class of 1963, 54 are former members of active-duty organizations—43 from USAF; eight, Army; two, Navy; and one from the Marine Corps.

WUNDER QUIZ. George Wunder, master of the adventure strip, *Terry and the Pirates*, has created this salute to some of the greats of aviation. Can you identify them? (See answers, page 36.)

You Ask It

Q. I was discharged from another branch of service as a technical sergeant in July, 1957. Three days later I enlisted in USAF in the same grade and have served in that capacity since. I have never taken a 7-level APT and would like to know if one will be required under provisions of the Quality Control Program?

A. Yes. Everyone must have a valid proficiency test score on their records. No one is being exempted from this phase of the program.

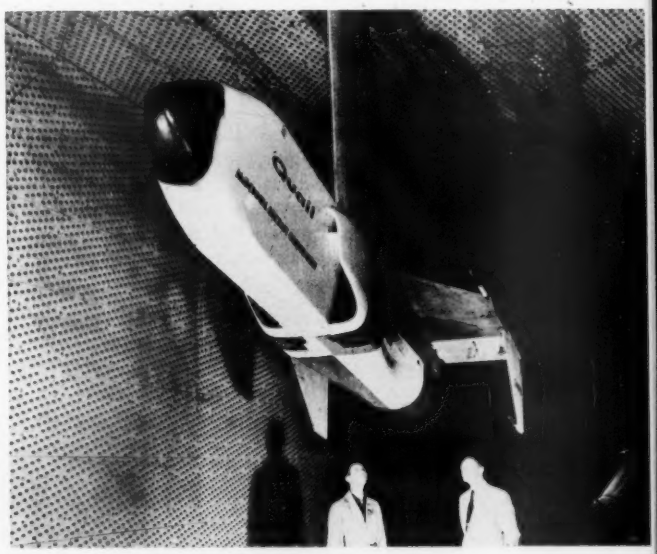
Q. I have an aeronautical engineering degree which I obtained before entering the Air Force. To date, my assignments have never utilized this knowledge. Is there any possibility that something may be done in coming months to rectify such situations?

A. In January of this year, USAF adopted an Officer Career Management Program, details of which are contained in AFR 36-23. Although it will take several months to reach a level of true effectiveness, it is designed to correct existing malassignments and to prevent future assignment problems.

Q. In view of the many frozen career fields and the hundreds of men in them who are approaching retirement, couldn't some action be taken to allow promotion to the next highest grade at time of retirement?

A. Present legislation governing retirement of all federal employees, including military, provides that retirement will be in grades in which these individuals have served. Promotion for the purpose of retiring in a higher grade could only be accomplished by passage of additional legislation, and USAF has long opposed adoption of such laws.

Q. Where could I obtain information regarding the last date of purchase of specific types of aircraft?



QUAIL ON THE WING. The jet-propelled GAM-72 *Quail* air-to-ground missile is shown in position for flight testing in the transonic test section of the Propulsion Wind Tunnel at Arnold Engineering Development Center. Supported by a vertical strut, the missile can be tilted to simulate climbing or diving. Exhaust from the engine is pumped out through the scoop in the background.

A. Contact the historian at Air Materiel Command. AMC is USAF's purchasing agent and should be able to supply such data.

Q. What is the authority for applying for USAF's Instructor Training program?

A. Basic information is contained in Chapter 7, Part Two, AFM 35-11. However, additional information has been released recently in letters and messages, and it would be advisable to contact your personnel officer for current details.

Q. I am due for discharge early this fall and will be eligible, at that time for a Korean GI home loan. If I reenlist, will I sacrifice this eligibility?

A. No. However, you will be bound by the same deadline — February 1, 1965 — as any other Korean veteran.

COUNTRY DOCTOR, 20th-century style, is Capt. Ben H. Koon (left), ultrasonic flight surgeon, attached to the 538th Fighter-Interceptor Squadron at Larson AFB, Wash. His strange office here is a flightline personal equipment room where he adjusts the pressure suit helmet of Lt. William T. Smith. The pair are preparing for a high altitude F-104B *Starfighter* mission. As a rated flight surgeon, the captain is required to make regular flights and has logged over 15 hours in the F-104, flying as high as 73,000 feet and as fast as Mach 1.9. The medic sports the red with white polka dot squadron colors on a neck scarf while flying; a matching bow tie and vest when off-duty; and his black bag has been, you guessed it, polka dotted.

Air Age Library

HISTORICAL

They Flew the Atlantic, Robert de la Croiz, (Norton, $3.95). True adventures of more than a score of air pioneers and their trans-Atlantic flights in the days when such action rated as the epitome of daring.

The Saga of Pappy Gunn, Gen. George C. Kenney (USAF, Ret.), (Duell, Sloan, and Pierce, $2.95). The biography of Lt. Col. Paul Gunn, special assistant to General Kenney at 5th Air Force Headquarters during WW II. Pappy Gunn is credited with some of the most brilliant, ingenious, and adventurous feats in the Pacific Theater.

FICTION

Alas, Babylon, Pat Frank, (Lippincott, $3.50). An absorbing novel of the U. S. following a nuclear war. Thought-provoking and significant, it dwells on social and economic problems facing survivors in a small south-central Florida community.

Cone of Silence, David Beaty, (Morrow, $3.95). This novel deals with the problems and complexities of a modern commercial jet airline. The author is a former BOAC pilot and paints a vivid picture of conversion to the latest form of commercial travel.

Jet Navigator: Strategic Air Command, Rutherford Montgomery and Lt. Col. Grover Heiman, USAF, (Dodd, Mead, $2.75). A fictional treatment of the role of a navigator on a combat-ready B-52 crew.

FOR THE LADIES

What Every Air Force Wife Should Know, Ester Weir, (Stackpole, $3.95). A reference guidebook which covers social, economic, domestic, and official and unofficial topics that bear on maintaining a USAF home.

BOOK CATALOG

Aero Publishers, Inc., 2162 Sunset Boulevard, Los Angeles, Calif., is offering free, a 1959 catalog of aviation and technical books, providing a roundup of publications covering every phase of aviation.

QUIZ ANSWERS

Aviation's mighty, pictured on page 35, are, top row, left to right, Capt. Ivan Kincheloe, Gen. "Tooey" Spaatz, Capt. Eddie Rickenbacker, Gen. Billy Mitchell, and Gen. Hoyt Vandenberg. Front row, l. to r., Gen. Jimmy Doolittle, Gen. Charles Lindbergh, Gen. "Hap" Arnold, Wilbur Wright, Gen. Claire Chennault, and Wiley Post.

career in USAF, I would advise him to consider the most important factor—satisfaction. If his contributions and rewards add up to real job satisfaction, he will gladly stay in. If they do not, he will join the 78 percent of us who get out each year.

Lt. Robert Hecklau
Homestead AFB, Fla.

★ ★ ★

UNKNOWN AIRMEN

Sir: *The back cover of the May issue carried a fine sketch of two fighter pilots. From their cap numbers and insignia patches, I assume they are assigned to the 337th Fighter-Interceptor Squadron. As a former member of that unit, I am most interested in determining their identities. Can you help?*

A/1C Terrence Christiansen
Empire AFS, Mich.

The sketch was made by our Art Director, SMSgt. Lester Bounds, from an uncaptioned photo which arrived at this office from an outside source. You are correct in assuming that they are members of the 337th. Can anyone aid in their identification?

★ ★ ★

WHY TESTING?

Sir: *Test! Test! Test! What do they prove? Now that master sergeants have completed a second round of supervisory examinations, it seems to me that the testing round was highly unnecessary. However, now that it has been done, why doesn't someone make an effort to inform those who fail of their weak points and assist them in planning a course of study against future testing periods?*

MSgt. Alfred Baczynski
Edwards AFB, Calif.

First, the new test, which was offered recently, was the result of a normal revision at the end of an extended period of use for the previous test. This is a standard practice, and retesting of all eligibles seems to be the fairest possible approach. Unfortunately, the tests, as presently constructed, are not broken into specific sections measuring the various aspects of supervision, management, leadership, and similar attributes. As closely as possible, it has been founded on principles of "horse sense." Therefore, it is virtually impossible to pinpoint a specific weakness within these categories. There are courses available on the subjects covered by the tests.

★ ★ ★

ACTIVE DUTY

Sir: *In the June issue of* THE AIRMAN, *you answered a letter from a reservist regarding the Longevity Service Award Ribbon by stating that the basic issue is for four years' honorable service. This is true, but the service must be* active *Federal military service.*

A/2C Rene Garza
Pope AFB, N. C.

You are correct.

★ ★ ★

Sir: *I thoroughly enjoyed the article,* Civil Air Patrol, Featherweight Champ of Airpower *which appeared in the March issue. However, it left a question in my mind. Can you tell me how many submarines were actually destroyed by CAP aircraft?*

A/2C Robert L. Cook
APO 283, New York, N. Y.

CAP headquarters, with conservative caution, lays claim to only two positive kills. However, the official record shows that CAP planes launched firepower attacks against 57 submarines. Some of these missions were conducted in partnership with military aircraft and patrol boats, summoned to the scene by CAP radio, and in cases of multiple attack it is always difficult to determine whose depth charges scored the final victory.

How it got its name

GEORGIA'S HUNTER

WHEN Maj. Gen. Frank O'Driscoll Hunter (Ret.) was stationed in France as a lieutenant during 1918 he never dreamed someday he would be the only living American to have an Air Force base named for him.

He was too busy flying combat missions against the Germans.

It all started a misty Sept. 13 when he and another pilot ran to their aircraft, hurriedly pre-flighted them, and were soon airborne over Champey, France.

A flight of six German planes appeared on the distant horizon. Lieutenant Hunter and his wingman, outnumbered three to one, attacked the enemy. A swirling, twisting dogfight ensued.

Lieutenant Hunter slipped his airplane behind a German aircraft during the battle. As the enemy fell across his sights he fired a long blast from his guns. The German plane faltered, began to spin slowly, and then plummeted to the ground and exploded. The others scattered.

A few days later near Verneville, France, the lieutenant led a flight of four American fighters into combat. Eight enemy airplanes, out of nowhere it seemed, appeared near them. The four Americans tore into the German formation.

Hunter approached one enemy plane from the side, belched his guns and soon the German fighter was spiraling downward, out of control. Seconds later the American was trailing another German plane, caught it, and blew it from the sky.

That day the Americans, members of the famous 103rd Aero Squadron, succeeded in destroying four aircraft.

The lieutenant's third major dogfight took place while he was flying alone. He spotted 10 German *Fokkers* attacking seven French *Brequets*.

Two *Fokkers* had boxed in one *Brequet*. Lieutenant Hunter strained his aircraft into a sharp, diving turn and fired on the Germans. He shot one down.

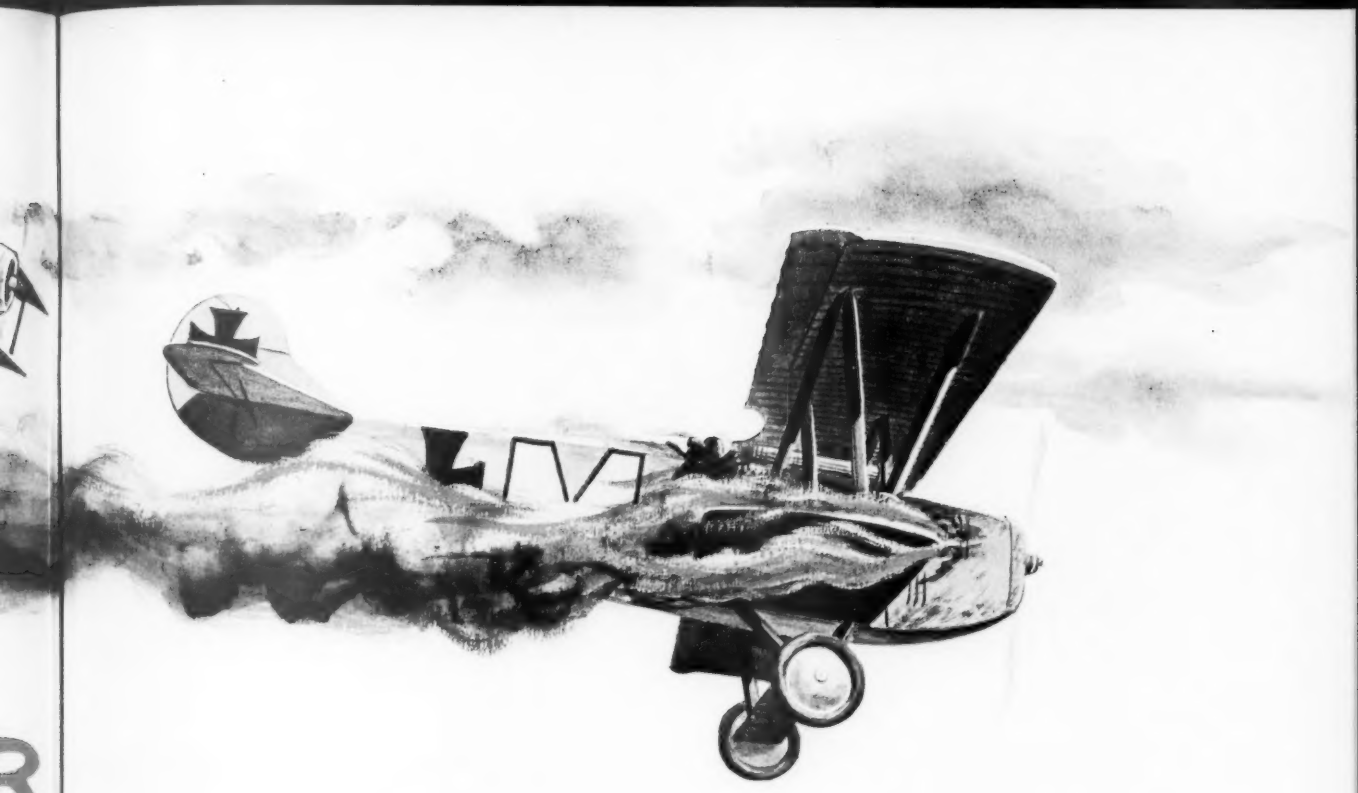
He looked up moments later to see five revenge-seeking *Fokkers* making a head-on pass at him. Their guns spouted fire. Undaunted, he pitched his aircraft over and rolled out to meet them. He fired. A *Fokker* began to break up. It caught fire and the others raced for home.

Less than a month later he was again flying by himself on patrol. He saw and attacked an enemy formation of six monoplanes and succeeded in shooting one down before the wild melee was over.

But, Lieutenant Hunter wasn't always so lucky in his against-the-odds battles with German airmen. On June 2, 1918 as he flew another unaccompanied mission he wound up tangling with two enemy fighters. He out-positioned one and fired. The two-winged bird lost altitude and trailed smoke. Soon it flamed and crashed.

But, during the air battle a German bullet had creased his forehead. He was losing blood. Despite his injury, he outfought the second German plane and then nursed his damaged plane home to safety.

By the time WW I was over Lt. Frank Hunter had chalked up eight



kills and was an ace. For his bravery he was awarded the Distinguished Service Cross with four bronze oak leaf clusters.

When he returned to his childhood home of Savannah, Ga., he received a hero's welcome from the townspeople. He was the southern city's favorite son.

Almost eight years later, in 1928, an airfield destined someday to become "Hunter Field" was opened by the City of Savannah as a municipal airport. It's name was changed to Hunter Field in 1940 when citizens decided to pay homage to their famous WW I ace.

In 1941 the Army acquired Hunter Field and used it as an Air Corps training base for several years. The Army Air Force's well-known Eighth Air Force was activated there during this time.

At the close of WW II Hunter Field was deactivated and returned to the City of Savannah for municipal airport operations. It remained a city-run airport for some time.

But in 1949 the Strategic Air Command moved a bomb wing to Savannah, and occupied a site eight miles northeast of the sprawling city. SAC's new Georgia home was Chatham AFB. The base, however, had limited facilities and SAC needed room to grow.

Savannah business leaders, rather than see SAC move from their Spanish-mossed city, offered to exchange airfields with the Federal Government. The city and county governments generously purchased 3,500 acres of additional land for future expansion of the field.

Hunter was back in the Air Force inventory in 1950 after a token payment of one dollar made the business transaction legal.

City fathers had one request of the Air Force. They wanted the new base to be called "Hunter AFB." Gladly, the Air Force obliged.

After WW I, the military career of Lt. Frank Hunter developed rapidly. He accepted a regular commission in the Army Air Service in 1920 and a year later was promoted to Captain.

His promotion to Major came after 15 years, but then, between 1940 and 1942 he moved from Lt. Col. to Brig. Gen. almost overnight.

During WW II the former lieutenant was back in the middle of battle again, this time as Commanding General of the Eighth Air Force Fighter Command, and later as the Commanding General of First Air Force.

General Hunter retired in 1946, and made his permanent home in Savannah.

Today, not far from his home at 218 East Gaston St., stand long lines of sleek B-47 jet bombers and other aircraft and buildings at Hunter AFB.

And there, amid the once low swamp land now filled and turned into long, concrete runways prevails a special feeling, a spirit.

It once caused a brave lieutenant in France to take on unfavorable, heavy odds in aerial combat and win out.

Now it's the spirit that causes men to stand alert duty, poised and ready by their jet bombers in the defense of a Nation.

Petroleum, oil, and lubricants personnel are on duty worldwide 24 hours a day.

Howl

That's the ques

THE *Stratofort's* powerful landing lights sliced through the night fog and lighted the runway below as the huge SAC bomber approached Westover AFB, Mass.

Moments later it was hovering a few feet above the ground, and then gracefully touched down with a screech of tires heard across the field by POL personnel.

An airman third class, new on the Petroleum, Oil, and Lubricants—POL—servicing crew, suddenly realized the B-52 had arrived and soon would be taxiing towards its nose dock. "Here I go again," he grumbled. The airman climbed into his pickup truck and pulled a JP-4 hose cart out towards the aircraft. As he neared the plane he heard the engines shut down and could see aircrewmen beginning to step from the jet bomber.

He brought his truck to a stop beside the massive bird. "How did it go, sir?" he asked the pilot. "Real smooth," he answered. "You'll fill her up alright, won't you?"

"Sure thing, sir," said the airman.

A "good night" ended their brief conversation as crewmen gathered up flying gear and boarded a yellow truck that had come from base operations to carry them to a debriefing room.

The mission for the six-man bomber crew was complete. They had been airborne eight hours, taken part in mid-air refueling operations, and flown a specified simulated combat mission. Soon, they would be driving to their homes, their work done.

But the workday for the airman from POL was only beginning and he wasn't particularly happy about it. He didn't enjoy working night hours and wasn't sure his job was important. He had come to do the job considered by so many as merely "routine."

His job was not difficult and it didn't have a crew-chief's glamour or a radar technician's importance. Once he had mentioned this to his supervisor. "You can't fly airplanes without fuel," his NCO had snapped.

These thoughts, among others, tumbled through his mind as he set about his work. The fuel he was now putting in the aircraft had been brought to the base by tank car and tank truck. It was loaded into bulk storage tanks and from there transferred by pipeline to the different fuel systems on the flightline and to a fill stand where trucks could pick up their fuel supplies.

There were two different methods of fueling, this

Westover AFB's Airman Pelky keeps account of aviation petroleum products at his base.

by 2d Lt. Thomas B. Harris III

Westover AFB, Mass.

Photos by TSgt. Robert Rosefield

w Important Can It Be?

's the question one airman asked about his job until something unexpected happened.

airman had learned. One was to connect the hose cart to pits buried in the hardstand in front of the nose docks. This is how he fueled the B-52.

Another was to take a loaded fuel truck and deliver the JP-4 to the aircraft parked on the flightline. When this operation was required a call came to the truck dispatcher and he logged the type of aircraft needing fuel, the requesting organization, kind of fuel wanted, and the plane's location.

All these things this airman thought about while he worked. He finally finished filling the B-52's tanks, unhooked his equipment, and took one last glimpse at the eight-jet bomber.

During the rest of the night, and early morning, the airman had other refueling jobs to do. A T-33 jet trainer had come in from a night cross-country mission and was in need of fuel. So was a C-47 which stopped off en route to Hunter AFB, Ga.

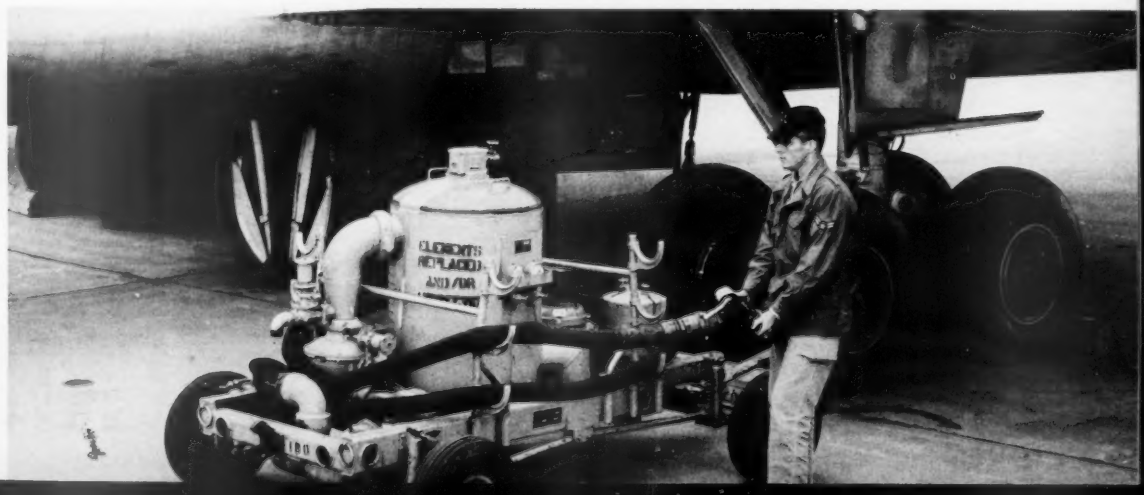
As the morning dawned he completed his work and went to the barracks. Now, as before, he felt he hadn't done much for himself or the Air Force.

While he was asleep SAC sounded an alert. On the Westover flightline SAC bomber crews dashed to their aircraft and were airborne within minutes. One plane aborted and the B-52 this airman had refueled was scheduled in its place. It took off "on time" and headed for the target.

When the young airman later learned this he suddenly realized something.

Maybe his job wasn't the most glamorous in the Air Force, but that bomber would have been as useless as an unarmed soldier in combat if he hadn't refueled it. His job was as important as anyone's on the Air Force team.

Complex equipment is used by POL specialists in refueling aircraft like the KC-135 and B-52. The handling of aviation gasoline and jet fuel requires special technical knowledge.



SLANTS ON SPACE

/// Know your ABCs. The letters are used to identify the three rings of Saturn, with A for the outermost and so on in. Monochrome photographs of the planet in books, as well as most drawings, often give a layman the impression there are only two rings. This is because A and B rings are far brighter than the innermost, C. The latter is known as the "crepe" ring on account of the dim, dusky character of its light. (Some works still render the word as "crape," the old English spelling for a fabric of dark, somber color.)

/ / /

/// In space nomenclature a primary has nothing to do with any election. It means a planet about which one or more satellites orbit. Thus the Earth is the primary for the Moon, as well as the artificial satellites now circling the globe. The time a satellite, natural or artificial, takes to make one circuit of its orbit is known as its period.

/ / /

/// Very few airmen will witness the total eclipse of the Sun on October 2. But don't feel cheated; only about once in four centuries is the spectacle of totality visible from a single given locality. This explains why eclipse expeditions are forever faring hither and yon to study the phenomenon.

For the coming eclipse the path of totality extends from central Massachusetts and southern New Hampshire across the Atlantic to the Canary Islands, on over the Sahara, Sudan and Ethiopia to the Indian Ocean where the show ends with sunset. Old Sol will appear in partial eclipse, however, to watchers from Greenland to the Caribbean, from Michigan to Pakistan, barring poor visibility.

Even observers on the limited high vantage points in the Massachusetts-New Hampshire belt will miss the start of the spectacular for the Sun will come over the horizon with the eclipse already in progress. The October 2 event is the last eclipse—solar or lunar—for '59.

/ / /

/// Do eggheads have an edge for space duty? A new line of psychological research has developed some favorable evidence that individuals of this so-called type seem to adapt quite well to an environment of isolation, motionlessness, and distorted reality that space flight would involve.

Studies of human reactions to complete solitude and deprivation of normal sensory stimuli have been going on for some years, of course. The latest experimental series, which has attracted Air Force support, has the novel approach of evaluating a subject's personality and intellectual resources before the testing begins.

Scientists supervising the program say that the persons who get a promising assessment in this advance screening may be classed as eggheads; those who don't, anti-eggheads.

As for the eggheads—or adapters—they have shown themselves to be sincere, sensitive, and creative individuals. They demonstrate a greater intellectual, emotional freedom than the nonadapters, as well as considerable resourcefulness.

The nonadapters have proved to be intellectually rigid, hardheaded, and practical (particularly where money was concerned). Under test they were generally restless, had difficulty pursuing rational thoughts, were disturbed by daydreams, and were apt to consider quitting before the ordeal ran its full eight hours.

A subject's ability is measured by how well he follows directions and controls certain mental processes during that time. Individuals tested thus far have been volunteers from a cross section of civilian life. If the studies develop further substantial data on the possibility of matching up personality characteristics with specific reactions during the isolation experience, the contribution to space medicine promises to be significant.

/ / /

/// The group designation, superior planets, applies to those with orbits outside the Earth's—Mars, the asteroids, Jupiter, Saturn, Uranus, Neptune, and Plato. That fact is well known. Why the "superior?" The explanation goes back to the thoroughly discredited concept of cosmic organization formulated in the second century A.D. by Claudius Ptolemaeus and known as the Ptolemaic Theory. It represented the Earth as the stationary center of the universe, with all other members of the Solar System revolving about our globe. Since the system obviously included the Sun, it, too, was assigned an arbitrary orbit. The more distant planets thus became "superior" in the sense of the word that their orbits were *beyond* the Sun's. Mercury and Venus, with orbits nearer the Earth, thereby became the inferior planets because their paths lay beneath the imaginary solar one.

Retention of the old terminology makes it possible to describe the asteroids or planetoids orbiting between Mars and Jupiter as both superior planets and also minor planets, the latter tag of much later vintage since the first of these bodies was not discovered until 1801.

/ / /

/// Not all comets develop tails but some have been observed sporting more than one. Early this century telescopic cameras snapped one with nine. Others seen in the past have had two, four, and six tails.

—WILLIAM A. KINNEY

In answer to queries regarding the position of the Military Air Transport Service and U. S. civil airlines, the results of recent articles and statements appearing in the public print by airlines executives, public officials, and other interested parties, Lt. Gen. William H. Tunner, Commander, MATS, made the following statement recently regarding the controversial charges of government competition with commercial carriers.

why MATS is important

MATS, like SAC and Air Defense Command, is in being only because it has a big wartime job. This job is to fly hundreds of missions in support of Department of Defense fighting agencies immediately after an emergency starts.

In order to fly these emergency missions, on time—which requires very intensive flying at very high daily rates of utilization of each aircraft—MATS must be flying daily in peacetime at a modest rate. It must fly at a modest rate so that it remains in condition, flexing its muscles so to speak, of supply, management, maintenance, communications, and all those other essential chores so necessary to do a big job when called upon.

We are reducing this programmed daily flying hour rate from six hours, now, to five hours flying for each aircraft. This output will have to be vastly increased the minute an emergency is called.

While flexing our air transport muscles in peacetime, we are fortunate that we can perform a useful service to the Department of Defense because of the very nature of our job. We can carry a portion of our Defense Department military people, their families, and military cargoes overseas and thus reduce the overall cost of the Department of Defense to the taxpayer.

Of course, MATS with its present size and minimum flying hour rate cannot do the whole job of flying the Armed Forces people and cargo so its calls on the civil carriers have increased annually to an all-time high of over $70 million this year versus $57 million in 1958; $50 million in 1957; and $43 million in 1956. This figure of $70 million does not portray the whole picture by any means, since the Department of Defense—through contract, charter, and air common carriage—will purchase something more than $200 million in airlift from the commercial carriers this fiscal year.

It must be noted that as MATS contracts for more business, more airlines organize and spring up to ask for a share of this business. In the last eight months, for example, 17 new airlines have been added to our bidders list. Most of these are actually new airlines.

The real problem we hear so much about today is why doesn't MATS give even more business to the airlines? MATS is in a tough spot here because MATS wants a healthy air transport industry, one that it can depend upon for support if war or other serious emergencies were to come.

MATS would like to give more business to the airlines but at the present there is no more business. Of course MATS could fly its aircraft empty or with dummy loads as some outside of MATS have suggested. If it flew empty and contracted out all its present business to the commercial world, it is estimated that the taxpayers of this country would soon be paying over one billion dollars annually for Defense Department airlift instead of the present one-fourth billion.

Well, what is the answer to this pressing problem of having a strong air transport industry and maintaining an essential MATS? The answer, as I see it, is to move more and more defense business overseas by air. For example, today 93 percent of Air Force officers, airmen, and their families move to and from overseas by both military and commercial air. This means a substantial monetary savings to the Air Force, compared to surface movements, as well as the saving of 12,000 personnel—or enough personnel to man three bombardment groups. If the Department of Defense as a whole were to adopt this policy it would increase our movement of government passengers to and from overseas by almost 50 percent. This would result, of course, in increased commercial augmentation.

Also an excellent start has been made toward greater reliance upon air delivery direct to overseas areas for highly complicated and very expensive items of military hardware. A number of years ago, the Air Force, recognizing the values of airlift as a means of reducing total procurement costs, adopted a procedure which requires all jet aircraft engines and other high-value items to be moved overseas by air rather than by surface.

The application of this then new procedure enabled a 22 percent reduction in an original engine procurement program. Many new jet engines cost over $500,000 each, so airlift became the means for a sizeable reduction in the Air Force and defense budget. There are many other high-value items like engines being procured by the armed services, but not all of them are as yet procured with the expectation of the short supply pipelines which result from air delivery.

flying brothers

No scores were kept but they confirmed their aims. Lt. Leroy J. Gallenstein, USAF, did the counting.

For two weeks last spring 28 U. S.-built jet fighter aircraft—flown and serviced by teams from five nations during "Operation Flying Brothers"—thundered off from Clark Air Base in the Philippines. When they weren't flying, the crews, along with observing officers from the participating nations, attended classroom seminars on fighter tactics; looked over displays of supersonic fighter systems; and climaxed the first annual Pacific Fighter Weapons Conference with a firepower and bombing demonstration.

No scores were kept during the noncompetitive meet jointly sponsored by the Philippine and U. S. Air Forces. The single aim was to improve the combat efficiency of the Asian nations participating in the U. S. Military Assistance Program. Philippine, Chinese, and Korean teams flew F-86F *Sabrejets;* the Royal Thai Air

Col. Tang Chung-Chieh, heading the Chinese team and Maj. Samran Yamsribua, leader of the Thai team, met over Clark, shook hands after landing.

Some of the pilots were Col. Tang Chung-Chieh, Republic of China; Maj. Park Chun Ho, Republic of Korea; Lt. Robert McCoy, USAF; Capt. Mana Jai-Ua, Thailand; Lt. Comdr. Charles Deasy, USN; and Capt. Leonardo Banzon, Republic of the Philippines.

Force team flew F-84G *Thunderjets;* the U. S. Air Force flew F-100 *Super Sabres;* and the U. S. Navy team F-8U *Crusaders*. On display were advanced supersonic fighters like the F-101 *Voodoo* and the F-102A *Delta Dagger*.

Symbolic of the spirit of cooperation, contribution, and camaraderie was the way enlisted ground crews from different countries pitched in to keep the jets flying for 281 sorties during a 12-day period. All 28 planes were in the air as a unit for a flyover at Manila's observance of Philippine Air Force Day.

"The high maintenance percentage reflects the cooperation and brotherhood that keynoted the entire conference," said Col. William B. Harris, USAF, project officer.

"We have learned very much . . . it has brought us much closer to our Asian Allies . . ." Lt. Gen. Kamol Thejatunga, Commander, Royal Thai Air Force.

". . . raised the skill of each officer and enlisted member of our team . . ." Majors Lee, Won, and Park, S. K., ROK Air Force.

". . . Understanding the problems of other countries makes for a better understanding for all concerned . . ." Major Chin Lee, Republic of China.

". . . meeting, getting to know, and working with the guys you might be flying with some day against a common enemy was an enlightening and valuable experience . . ." Flt. Lt. John W. Newham, Royal Australian Air Force observer.

SSgt. Oh Wan Kook, ROKAF, got a helping hand from SSgt. Larry Slone and A/3C John Schloss, USAF.

Smoke bomb marks a hit scored by Royal Thai Air Force F-84 Thunderjet.

By Mid-July, 1943, Allied Air Forces in Europe were beginning to increase in size, and Hitler's Festung Europa *was ticketed for . . .*

DEFEAT FROM THE AIR

by SMSgt. Hal Bamford

On January 14, 1943, President Franklin D. Roosevelt and Prime Minister Winston S. Churchill began the discussions which are recorded in history's pages as the Casablanca Conference.

Out of this two-week personal meeting emerged several decisions which were to figure prominently in future Allied actions. Probably the best remembered was their "unconditional surrender" ultimatum.

Closely allied to this was a clear-cut program for future strategic bomber actions. The now-famed Combined Bomber Offensive was approved and, for the first time, a primary objective of airpower unmistakably outlined.

The enlarged scale of air attack against Germany was pointed at "the destruction and dislocation of the German military, industrial, and economic system and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened."

CBO's official operation began on June 10. Less than two weeks later, the wisdom of the decision became obvious when the first daylight effort against the Rhur was mounted. From that date forward, strategic daylight bombing efforts were successfully coupled with the RAF's night attacks to present increasingly devastating around-the-clock destruction.

On July 28, 1943, the deepest penetration yet attempted was launched. The target was *AGO Flugzeugwerk,* a major producer of FW-190s, located near Oschersleben, about 90 miles southwest of Berlin.

A force of 120 B-17s, equipped with long-range tanks, feinted in the direction of the much-bombed Hamburg-Kiel area. At the strategic moment, 39 of the bombers broke away and began their perilous journey inland.

The long flight proved to be a running battle almost from the very first. Even before leaving the main formation they encountered an enemy who used every defensive device he could muster including aerial bombs, large-bore cannon, and rockets, supplemented by concentrated flak barrages from the ground.

A graphic account of the running battle is contained in the citation included in War Department General Order 85, dated 17 December 1943. The order cites the contribution of Flight Officer John C. Morgan, copilot of one of the B-17s assigned to the mission, who was awarded the Medal of Honor.

For conspicuous gallantry and intrepidity above and beyond the call of duty, while participating in a bombing mission over enemy-occupied continental Europe, 28 July 1943. Prior to reaching the German coast on the way to the target, the B-17 airplane in which Flight Officer Morgan was serving as copilot was attacked by a large force of enemy fighters, during which the oxygen system to the tail, waist, and radio gun positions was knocked out. A frontal attack placed a cannon shell through the windsheld, totally shattering it, and the pilot's skull was split open by a .30 calibre shell, leaving him in a crazed condition. The pilot fell over the steering wheel, tightly clamping his arms about it. Flight Officer Morgan at once grasped the controls from his side, and by sheer strength, pulled the airplane back into formation despite the frantic struggles of the semiconscious pilot. The interphone had been destroyed, rendering it impossible to call for help. At this time the top turret gunner fell to the floor and down through the hatch with his arm shot off at the shoulder and a gaping wound in his side. The waist, tail, and radio gunners had lost consciousness from lack of oxygen and, hearing no fire from their guns, the copilot believed they had bailed out. The wounded pilot still offered desperate resistance in his crazed attempts to fly the airplane. There remained the prospect of flying to and over the target and back to a friendly base wholly

Flight Officer John C. Morgan

unassisted. In the face of this desperate situation Flight Officer Morgan made his decision to continue the flight and protect any members of the crew who might still be in the ship and for two hours he flew in formation with one hand at the controls and the other holding off the struggling pilot before the navigator entered the steering compartment and relieved the situation. The miraculous and heroic performance of Flight Officer Morgan on this occasion resulted in the successful completion of a vital bombing mission and the safe return of his airplane and crew.

In addition to major damage to a goodly portion of the flight, no less than 15 aircraft assigned to the Oschersleben raid failed to return to their home stations.

However, the victories did not all belong to the Germans. The defenders lost a total of 56 fighters, and, despite the fact the bombing had been done through a 9/10s overcast, reconnaissance photos showed a truly amazing concentration of hits. Intelligence estimates placed the loss of production at a minimum of four weeks.

Before the order citing Morgan could be published, he was promoted to the grade of second lieutenant. The December citation made him the third ETO airman, in point of events, to receive this Nation's highest award.

Both his predecessors, Lt. Jack Mathis (See, *Wounded Aboard,* June '59) and Sgt. Maynard Smith (See, *Hinges of Hades,* July '59), as well as Lieutenant Morgan were members of the 8th Bomber Command, a growing force in the European Theater.

In months to come, strategic bombardment was to become a major factor in the destruction of Hitler's Europe. It was pioneers in the unproven field of daylight bombing, such as these three, who were to lead the way for the thousands that followed them into aerial combat.

THINGS TO COME

The role of strategic bombardment in the winning of the battle of Europe has often been understressed. In retrospect, however, military historians are inclined to agree that even before the invasion of Europe, Germany was reaching a state of helplessness.

Armament production was rapidly declining; all cohesion of effort was missing; and total disruption and disintegration was well advanced.

True, the many German armies were still in the field, but their supporting economy was already bordering on complete collapse. There are now convincing indications that they would have been forced to cease fighting within a very few months.

Considering the numbers of Allied aircraft that were brought to bear against them, this is not difficult to understand. At their peak, more than 28,000 combat planes were massed to the west of Germany alone. Nearly 1.5 million men concentrated their efforts in this aerial siege. Bomb tonnage totaled approximately 2.7 million, unleased from 1,440,000 bomber sorties. Nearly three million additional fighter sorties were concentrated against this same enemy.

The price in men and machines was high. Combined British and American airmen losses reached nearly 160,000.

While no accurate figures are available, estimates place the German losses at nearly a million killed and wounded in aerial attacks, and more than 57,000 aircraft destroyed.

It was a chapter of aerial history written in blood, but more conclusive proof of airpower's value could not have been conceived—even in fiction.

BASELINE USAF

OPERATIONAL BOMARCS DUE THIS MONTH

Washington, D. C.---The Nation's first Bomarc missile site is scheduled to become operational this month at McGuire AFB, N. J., providing the New York-Philadelphia area with long-range, unmanned intercept protection.

Manning the East Coast site will be 165 airmen and 16 officers of the 46th Air Defense Sq. (Missile), first unit to graduate from the Air Force's Santa Rosa Island, Fla., missile training school.

After the McGuire site becomes operational 13 other U. S. missile bases and two Canadian sites will go into operation.

The Bomarc is a surface-to-air missile system which becomes fully automatic when coupled with the SAGE air defense system. It can successfully destroy supersonic single and multiple targets when fired on orders from a SAGE control center. The ground computer locates the target, identifies, and tracks it. The Bomarc is then launched by the SAGE control center and directed toward the target. At a specified point ground control is discontinued and the guidance system of the Bomarc takes over. The missile guides itself for the intercept.

Planned for McGuire AFB is the Bomarc IM-99 with a range of over 200 miles. It is designed for the defense of large areas.

The Mach 2.5 weapon has a wing span of 18 feet, is 47 feet long, and has a diameter of 35 inches. It combines the high thrust features of its booster rocket with the fuel economy of its twin ramjet engines to achieve altitudes above 70,000 feet. It can carry a nuclear or conventional warhead.

Previously the weapon has been fired from control centers as far as 1,500 miles from the launch site and has successfully tracked and destroyed its target.

Newer Model B Bomarcs are presently planned for the Air Force's missile inventory and deployment. These differ from earlier models in their use of a solid propellent rocket in place of a liquid-fuel rocket.

They are advanced weapons with a range of more than 400 miles, designed to reach out and knock down enemy aircraft and some missiles even further away than their predecessors. In both cases rockets boost the missile to supersonic speeds after firing, with the missile shifting to twin ramjet engines for power.

After the McGuire AFB missile site is equipped other bases will be furnished with the deadly weapon. Dow AFB, Me., Otis AFB, Mass., and Suffolk County AFB, Long Island, N. Y., will be manned prior to the other 10 U. S. sites.

years old this month

the *United States Air Force* fulfills its responsibilities to the Nation for the conduct of *offensive and defensive air operations* around the globe and in the aerospace above it...

- *Organize, train, and equip Air Force forces for the conduct of prompt and sustained combat operations in the air—specifically, forces to defend the U. S. against air attack in accordance with doctrines established by the JCS, to gain and maintain general air supremacy, to defeat enemy air forces, to control vital air areas, and to establish local air superiority except as otherwise assigned.*

- *Develop doctrines and procedures, in coordination with the other Services, for the unified defense of the U. S. against air attack.*

- *Formulate doctrines and procedures for the organizing, equipping, training, and employment of Air Force forces.*

- *Develop, in coordination with the other Services, doctrines, procedures, and equipment for air defense from land areas, including the continental U. S.*

- *Organize, train, and equip Air Force forces for strategic air warfare*

- *Furnish close combat and logistical air support to the Army, to include airlift, support, and resupply of airborne operations, aerial photography, tactical reconnaissance, and interdiction of enemy landpower and communications.*

- *Provide air transport for the Armed Forces, except as otherwise assigned.*

- *Organize and equip Air Force forces for joint amphibious and airborne operations, in coordination with the other Services, and to provide their training in accordance with doctrines established by the JCS.*

- *Furnish aerial photography for cartographic purposes.*

EXTRACTED FROM AFR 55-43

The Airlift Memorial at the entrance to the Tempelhof Airport

Faith in freedom has brought the peoples of the free world closer together than ever before in history, and this has come in part from freedom's stand in Berlin.

General Lucias D. Clay
(USA, Ret.)